

STORIES

IN AGRICULTURE AND LIFE SCIENCES VOL.11 NO.1 2017

SEEDING ECONOMIC DEVELOPMENT

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State's industrial playground

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diversify, boost profits

STORIES

IN AGRICULTURE AND LIFE SCIENCES

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FOREWORD

SEEDING ECONOMIC DEVELOPMENT ALLOWS COMMUNITIES TO BLOOM.

This spring I attended the Iowa Young Professionals in Agriculture Executive Breakfast at the Iowa FFA Enrichment Center. Mark Core ('87 agricultural and life sciences education), executive vice-president and chief marketing officer of Vermeer Corporation, served on a panel about change—dealing with it and leading it.

Mark talked about the changing supply of potential employees for rural Iowa. Attracting people to rural Iowa through job creation, quality healthcare and schools and access to broadband, draws people to support community infrastructure. This fuels everything from volunteer fire departments to local FFA chapters to civic organizations and everything in-between.

That's where Iowa State comes in. Partnering with companies like Vermeer in collaborative research, talent acquisition and internship programs drives economic development and helps communities grow. That especially benefits our new alumni—nearly 70 percent of whom start their careers in Iowa.

In this issue you'll learn how the Center for Crops Utilization Research is helping companies refine their industrial processes to maximize efficiency and profits (page 18). You'll hear from Kevin Kimle ('91 MS economics), director of the Agricultural Entrepreneurship Initiative, on the ecosystem of entrepreneurship (page 14) and learn about the initiative's latest impacts supporting agricultural start-ups. From local foods (page 25) to the incredible egg (page 28) to the impact of trusted counsel in farm management (page 31), you'll see how the College of Agriculture and Life Sciences provides connections, talent and technology to fuel economic development.

In closing, I'd be remiss if I didn't mark the occasion of this, our 20th issue of STORIES magazine. In my first foreword, I laid out our team's mission to share stories that inform, educate and inspire—stories that connect you with the people who make our college one of the premier institutions of agriculture and life sciences in the world. Our stories are your stories. Thank you for allowing me the honor of sharing them with the world.

I invite you to join me. Share your copy of STORIES with a friend or neighbor when you're through, or share a link to our stories via www.stories.cals.iastate.edu. I can't wait to discover what the next 20 issues have in store for us!



Kind regards,

Melea Reicks Licht



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ON THE COVER

Edan Lambert (left), a junior in animal science, chats with **Sara Hunter** ('06 animal science) during a recent visit to the Vermeer Applied Technology Hub at the Iowa State University Research Park. Vermeer's location in the park makes it easy to partner with Iowa State by hiring students, collaborating with faculty and more. Learn more on page 22. Image by Christopher Gannon.

When you talk about Iowa's economy, our state agriculture is a prime topic of conversation. It's often ranked first in the nation. First in corn and soybean production, first in hog production, first in egg-laying chickens and highly ranked in other areas. Agriculture serves as one of the main economic engines for the entire state.

One in 10 jobs in the United States is tied to food and agriculture; that was 16 million jobs in 2011. The 2011 value added to the gross domestic product from agriculture and related industries was \$743 billion—nearly 5 percent of total U.S. economic output. Many years, agricultural exports are the bright spot on the nation's trade balance (Iowa makes a huge contribution here).

Every year, in Iowa, we track food chain links from gate to plate. Employment related to the food chain was more than 388,000 jobs in 2016, nearly 20 percent of Iowa's employment. Twenty-three percent, over \$40 billion, of the state's gross domestic product was linked to agriculture.

Iowa and the whole north-central region of the nation represent a powerhouse of world-leading agricultural productivity. That's why I constantly speak out on the need to support world-class public university agricultural research and extension programs. They play a critical role for the future of agriculture and the state economy.

As dean, I believe our college truly strives to provide world class education, research and extension—and stay true to our land-grant mission. This includes creating research, practices and techniques to conserve and protect our natural resources, so that Iowa remains an economic leader in agriculture for the coming centuries.

Yes, centuries. Sustaining those natural resources supports our agricultural productivity and the state's economic future. It is money well spent.



Wendy Wintersteen

Endowed Dean of Agriculture and Life Sciences

UNDERSTANDING THE DIVERSITY OF LIFE

Story by Brian Meyer
Image by Christopher Gannon

Growing up, Jo Anne Powell-Coffman and her family would recite the Serenity Prayer every evening at the dinner table.

"My parents were divorced, and from the time I was 12 I lived with my mother, who was a social worker. I moved from school to school, depending on where my mother could get a job," says Powell-Coffman, chair of the Department of Genetics, Development and Cell Biology (GDCB). "Often, we ate food from local food banks. If it was a bad month, we used food stamps. My mom's refrain always was: We're broke, not poor."

She went to college courtesy of need-based federal Pell grants. "I went with a lot of gratitude just for the chance to go," she says.

At the University of California at Davis—that state's land-grant institution—she hungrily took one of everything from a smorgasbord of classes. Something clicked when she took her first-ever biology class.

After that, she couldn't get enough life sciences courses. In a cellular physiology class, the instructor handed back mid-term exams, but hers wasn't included.

"Later I learned she kept the top-score exams and made us come to her so she

could meet us one on one," says Powell-Coffman. "When she handed me my test, she told me I needed to be doing research."

The instructor then put her to work in her own lab.

Powell-Coffman attended graduate school at the University of California at San Diego and then completed a postdoctoral research fellowship at the University of Colorado at Boulder, where she began working with the model species she's relied on through today: The microscopic nematode (or tiny roundworm) *C. elegans*.

Her lab at Iowa State was the first to discover a genetic factor in *C. elegans* comparable to one in humans. The factor regulates gene expression in response to changing oxygen levels. Labs around the world now are using her model to study and find regulators important to improving health or stymieing disease.

Powell-Coffman has been a member of the Iowa State faculty for nearly 20 years, and has served as chair since 2013. The department, co-administered by the College of Agriculture and Life Sciences

Jo Anne Powell-Coffman, chair of the Department of Genetics, Development and Cell Biology, says this quilt hanging in her office—presented to her mother by senior center residents in appreciation for her volunteerism—is a daily reminder of where she came from, the gratitude for her own land-grant education and the privilege it is to serve students.

and the College of Liberal Arts and Sciences, excels in biological discovery and making it relevant to undergraduate and graduate education.

GDCB is a partner in delivering key courses for hundreds majoring in biology, genetics, bioinformatics and computational biology, and a major contributor to multiple interdisciplinary graduate programs. Its faculty constantly strive to understand what engages students, especially in introductory classes—the gateway courses that, if successful, can open eyes to promising career paths, as was the case for Powell-Coffman.

The line in the Serenity Prayer about the courage to change resonates today with how she thinks about education and science.

"With the incredible amount of data we're able to generate, we now have the ability to analyze and truly begin to understand the diversity of life," she says. ☞

STORIES EXTRA: www.stories.cals.iastate.edu

Read more online about Jo Anne Powell-Coffman's advice for young scientists—and what she tells her teenage kids not to do.

50 YEARS

POWERING STUDENT SUCCESS

Story by Dana Wilson
Image by Christopher Gannon,
Special Collections and University
Archives/Iowa State University Library



It was August 1967 when Carl Bern first walked into a classroom at Iowa State University. He began his career in agricultural engineering as a

teaching assistant, and has taught students at Iowa State every term since.

Over the past 50 years, Bern has seen immense changes in technological innovation. He explains the “founding fathers” of agricultural engineering created four sub-disciplines reflecting engineering needs in agriculture: soil and water, power and machinery, structures and environment, and electric power and grain preservation.

Between 1920-1970 almost all farms in the United States became connected to line power, and agricultural engineers were a key part of this effort.

“Electric power on farms transformed the life of farm families. They were no longer limited to sunlight hours or candles and lanterns. It impacted their home life, too. It’s the pits to have to do homework by candlelight,” Bern says.

The first use of electric motors on the farm was usually to power fans and conveyors for grain preservation, according to Bern. Grain preservation became his primary research focus, and he taught many courses and mentored several students researching the topic.

One of his former students is now chair of his department.

“Dr. Bern was a very caring academic adviser and instructor. He was always available to answer questions and wanted to ensure students understood what he was teaching. He engaged students in active learning and made it fun to learn,” says Steve Mickelson, professor and chair of the Department of Agricultural and Biosystems Engineering.

In 2013 Bern began a part-time appointment. He guest lectures and teaches labs in an introductory agricultural and biosystems engineering class. He says this allows him to focus more on the three things he enjoys most: mentoring students, research and travel.

“In 2007 my wife and I went with a church group to Tanzania, and noticed corn stored on farms by smallholder farmers was frequently riddled with

weevils. I saw the weevils there are the same as in Iowa, and I thought to myself, ‘I can use engineering to do something about that,’” Bern says. “Smallholder families depend on their stored corn for food. Losses to maize weevils can be devastating.”

As he talks about the trip that inspired his current work on grain storage in developing countries, a tiny maize weevil, *Sitophilus zeamais*, crawls up the wall inside his office in Elings Hall. With a laugh, he says a few of the insects must have found their way out of a shipping container from an order he received the previous week.

Bern says he’s looking forward to continuing his international work and mentoring students.

“I’ve been so fortunate to be given the opportunity to be part of this faculty, working in world-class facilities. It means everything to me, and is a central part of my life. I’m very blessed to be sitting here 50 years later,” says Bern. 📖

Story by Barb McBreen
Image by Christopher Gannon,
Special Collections and University
Archives/Iowa State University Library

50 YEARS

A GROWING LIST OF LEARNERS



Don Beitz has kept a list of every student he’s ever taught during his 50 years at Iowa State—that’s 13,000, and counting.

This fall, Beitz begins his 51st year as a professor and researcher at Iowa State University.

He says his career has been filled with blessings and opportunities that he attributes to mentors and students. Beitz first learned how much he enjoyed teaching as an eighth grader in a one-room school in Illinois.

“The teacher had a system that I thought was fantastic,” Beitz says. “I would get assigned to teach mathematics or science to younger students, and that’s when I learned that teaching was an enjoyable experience.”

Beitz, a Charles F. Curtiss Distinguished Professor of Agriculture and Life Sciences in animal science and biochemistry, biophysics and molecular biology, says the best thing about teaching is inspiring others.

Angela McCleary-Wheeler (’01 agricultural biochemistry, ’05

veterinary medicine) is one of those students. She nominated Beitz for the Iowa State University Alumni Association Faculty/Staff Inspiration Award, which he received in May. When she saw the announcement for the award she immediately thought of Beitz.

“It didn’t matter if you were a post doctoral fellow or an undergraduate student in his lab. The environment was welcoming and engaging, so you felt like you were part of the team,” McCleary-Wheeler says.

McCleary-Wheeler, an assistant professor of oncology at Cornell University, says he was a fantastic teacher and adviser who had a major impact on her career trajectory.

“He always had that inquisitive nature and that whole environment fostered learning,” McCleary-Wheeler says.

Another graduate, Jim Roth (’75, ’79 MS, ’81 PhD veterinary medicine), a Distinguished Professor of Veterinary Microbiology and Preventive Medicine at Iowa State, also had Beitz as a professor. He says Beitz was cheerful, enthusiastic and was able to make biochemistry interesting.

“He was very interested in student learning and he wanted students to learn

and know why they were learning,” Roth says. “He was a great teacher. He made biochemistry interesting and applied. I really appreciated that as a student.”

Beitz’s first class was introductory biochemistry 301, which met at 8 a.m. on Monday, Wednesday and Friday.

“That was the best experience—to just jump right in and teach. I have to admit, I have been enjoying it ever since,” Beitz says.

When asked for advice for new faculty, Beitz says it’s important to get established as a researcher and start teaching as soon as possible.

“I like to see people start teaching right away because teaching gets you into the university experience,” Beitz says.

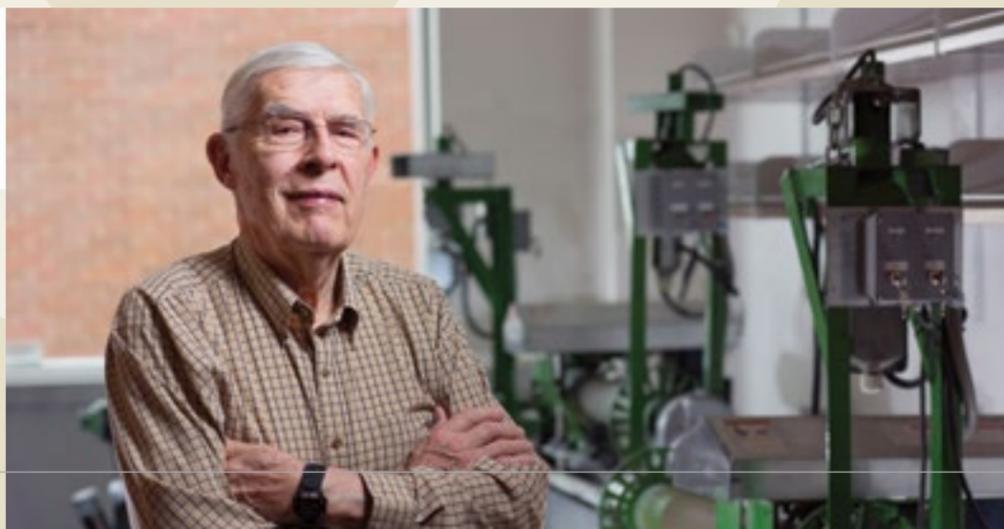
Beitz says he couldn’t have been so successful without his wife, Judy.

“I’ve been very fortunate to have married the right person,” Beitz says.

“A happy home life is extremely important for a person’s professional success.”

Hearing a thank you from a former student is priceless, Beitz says. “My students are my pride and joy—teaching is my fun.” 📖

During Carl Bern’s 50-year career he’s seen electricity transform life on the farm and needs and opportunities for agricultural engineering. Bern continues to guest lecturer and teaches labs while focusing on what he enjoys most: mentoring students, research and travel.



Don Beitz begins his 51st year as a professor and researcher at Iowa State this fall. A Charles F. Curtiss Distinguished Professor of Agriculture and Life Sciences in animal science and biochemistry, biophysics and molecular biology, Beitz says the best thing about teaching is inspiring others.

STORIES EXTRA: www.stories.cals.iastate.edu



Join Carl Bern and Don Beitz in a series of videos online as they reflect on their 50-year careers.



Hugo Ramirez-Ramirez draws on experience from central Mexico and with Iowa dairy farmers to inform his approach to undergraduate education. "Having a sound nutritional program is one of the most effective things farmers can do to manage their cost of production," he says.

PREPARING REAL-WORLD PROFESSIONALS WITH REAL-WORLD DATA

Story by Grant Wall
Image by Christopher Gannon

Hugo Ramirez-Ramirez is a land-grant triple threat.

His appointment at Iowa State is three-fold, combining extension, research and teaching. His class, Applied Dairy Farm Evaluation, provides students with a capstone experience to their undergraduate career.

"Each student in the class works with a real farm," Ramirez-Ramirez says. "They have access to the farm's data and analyze those records throughout the course of the semester."

It provides an opportunity for students to move away from the theoretical and put what has been taught in a classroom to use.

"I really try to bring as much knowledge and information about current issues I've gathered from my extension work into the classroom," Ramirez-Ramirez says. "That allows students to know what people are experiencing and get a taste of what is going on in the industry."

It was his own experience on a dairy farm in central Mexico that shaped the way he approaches education.

Ramirez-Ramirez, an assistant professor and extension dairy specialist with Iowa State University, spent the year after earning his undergraduate degree as the dairy herd manager at a farm in Leon, Guanajuato, Mexico, where he was responsible for the care of 1,000 animals.

"That experience helped me realize the type of things students will need to have in their toolbox when they graduate," Ramirez-Ramirez says. "It helped me develop a teaching style that combines things that may seem abstract and show why that information is important when managing a farm."

His research and extension appointments allow him to work directly with dairy producers in Iowa, focusing on dairy nutrition and forage quality. The dairy industry in Iowa produces over \$800 million annually in milk sales from

over 210,000 dairy cows, making it the 12th-largest milk producing state in the country.

"Knowing that, in one way or another, I am able to support their efforts is very rewarding," Ramirez-Ramirez says.

Ramirez-Ramirez is conducting research on the chemical and physical processing of corn stalks used to increase feed value for cattle. While the research is still ongoing, preliminary indications show additional feed value can be found in corn stalks. An increase in their feed value could help farmers better navigate current marketplace conditions.

"Having a sound nutritional program is one of the most effective things farmers can do to manage their cost of production," Ramirez-Ramirez says. "Feeding dairy cows represents 50-60 percent or more of the cost of producing milk. Anything that can be done to manage those costs is a positive thing for farmers." 📖

NEW COLLEGE LEADERSHIP



• **John Lawrence** ('84 animal science, '86 MS economics), interim vice president of Iowa State University Extension and Outreach, formerly CALS associate dean for extension and outreach and director of agriculture and natural resources extension



• **Jay Harmon**, interim CALS associate dean for extension and outreach and interim director of agriculture and natural resources extension, will continue as professor of ag and biosystems engineering and extension and outreach livestock housing specialist



• **Hongwei Xin**, CALS assistant dean for research, will continue as director of Egg Industry Center, Charles F. Curtiss Distinguished Professor and Iowa Egg Council Endowed Professor in agriculture and biosystems engineering and animal science



• **Mark Honeyman** ('77 animal science, '83 MS, '89 PhD), CALS associate dean for operations, will continue as professor of animal science and agricultural education and studies and coordinator of the statewide ISU Research and Demonstration Farms



CALS TEAMS TRIUMPH

- College of Agriculture and Life Sciences students won the overall sweepstakes award at the **North American Colleges and Teachers of Agriculture (NACTA)** Judging Contest on April 7 at Kansas State University. For the third year in a row, Iowa State teams (pictured) won the overall sweepstakes award among four-year institutions.
- The **Iowa State Crops Team** won first place at the American Royal Livestock show, Nebraska College of Technical Agriculture Crops Contest, Iowa State University Crops Contest and NACTA Crops Contest. They earned second place at the Chicago Collegiate Crops Contest.
- **Brady Goetz** (junior, animal science), **Holly Brown** (sophomore, animal science), **Tymbrie Snobl** (senior, animal science) and **Breyer Ott** (senior, animal science) received second place at the American Society of Animal Science and American Society of Dairy Science Midwest Regional Academic Quadrathlon.

NATIONAL HONORS FOR FACULTY EXCELLENCE

- **Joe Cordray** ('71 animal science), extension meat specialist, Smithfield Chair in Meat Extension and professor-in-charge of ISU Meat Laboratory, inducted to Meat Industry Hall of Fame
- **Joe Sebranek**, Charles F. Curtiss Distinguished Professor and Morrison Endowed Chair in Meat Science, inducted to Meat Industry Hall of Fame
- **Stephanie Hansen** ('02 animal science), associate professor of animal science, American Society of Animal Science Outstanding Young Researcher Award
- **Mike Castellano**, associate professor of agronomy, Soil Science Society of America Early Career Professional Award
- **Susana Goggi**, associate professor of agronomy, Crop Science Society of America fellow
- **Ali Tabatabai**, professor of agronomy, Soil Science Society of America Distinguished Service Award

Fond Farewells

- **Lois Wright Morton**, professor, sociology, retired in April
- **Russ Mullen**, professor, agronomy, retired in April
- **Vince Lawson** ('75 horticulture, '83 MS), superintendent, Iowa State Muscatine Island Research and Demonstration Farm of Fruitland, retired in January

Hearty Hellos

- **Fred Hall** ('81 dairy science), dairy field specialist, ISU Extension and Outreach
- **Erik Potter**, swine field specialist, ISU Extension and Outreach
- **Catherine Swoboda** ('08 agronomy, '10 crop production and physiology), lecturer, Global Resource Systems
- **Emily Zimmerman** ('11 biology, global resource systems), lecturer, Global Resource Systems

DISCOVERING HIS NORTH STAR

FIVE QUESTIONS WITH WHITE HOUSE INTERN DAKOTA OLSON



Story by Melea Reicks Licht
Image by Christopher Gannon

Dakota Olson is fresh off the internship of a lifetime.

Olson was part of Michelle Obama's personal communications team in the White House last fall. The junior double-majoring in global resource systems and agriculture and society from Keswick, Iowa, was one of more than 10,000 applicants for 15 internships available in the White House.

To many, it may appear Olson has had more than one "internship of a lifetime" while at Iowa State. As part of the college's Center for Sustainable Rural Livelihoods, he's worked alongside Ugandan college students to develop and deliver curriculum and manage sustainable compost pits for rural primary schools. He speaks Spanish and is fluent in Advanced

American Sign Language (Olson is Deaf with a cochlear implant). His language skills have proved key in navigating agricultural learning experiences in Haiti, Mexico, Spain and Holland.

Olson reflects on his experiences in the White House and how they may shape his future.

Was your experience in the White House what you expected?

Most people, when they think about an internship at the White House, can't help but envision daily fist-bumps with the president, browsing memes on the internet with the vice president, gardening with the first lady and giving some clever advice to the press secretary. A lot of the experience just isn't that glamorous. You've got to do

what is expected of most interns in any office—copy papers, clear a jammed printer, stuff envelopes and do a lot of reading. In fact, one of the first pieces of advice I got was to just "keep your head down and get your work done." An office can't function if interns are spending half of the workday lingering outside of the Oval Office hoping to see the president.

It's all worth it when you get to attend weekly speaker series with White House senior staff and ask them anything you want or attend staff holiday parties and rub shoulders with some incredible people or even stand out on the South Lawn and greet the president and first lady as Marine One lands.

Dakota Olson was part of Michelle Obama's personal communications team in the White House last fall. His internship and study abroad experiences helped him discover his passion for serving others.

What obstacles did you have to overcome to be a successful intern?

In order to build up a resume to be prepared for such a prestigious opportunity I had to constantly be outside of my comfort zone and face adversity head-on. The biggest barrier that I face is that I am Deaf with a cochlear implant. All my life I have been placed in environments that just aren't designed for people like me. I've traveled to countries in the Global South (the collective term for nations of Africa, Central and Latin America and most of Asia) without American Sign Language interpreters and been in work environments that pushed me to my limit and caused me to redefine my barriers. These experiences forced me to advocate not only for my needs, but those of others as well in order to level the playing field and provide equal opportunities for people with disabilities.

The White House was a different story, however. I found it to be an incredible and inclusive atmosphere providing equal opportunities for people with disabilities and of various races, ethnicities, religions and other minority factors. I found the White House work environment to be built with an inclusive design in mind—videos were already captioned, sign language interpreters were provided and any accommodations I needed could easily be requested.

Within the first few weeks, I connected with the West Wing receptionist (known by ROTUS, or Receptionist Of The United States, to many) who is Deaf. Leah Katz-Hernandez is a true barrier-breaker as a Deaf, Latina woman working in the most prestigious office in the world in one of the most front-facing positions. She was an excellent mentor and role model for me, providing me with valuable insight and advice on being a Deaf person working in the White House and how to succeed.

As far as making this experience work for me, I am so incredibly grateful to have the strong and unwavering support of my parents and family, Iowa State University, the College of Agriculture and Life Sciences, my professors and faculty and incredible folks in D.C.

How does an intern manage the first lady's correspondence?

Our role was less about correspondence, but more about managing how the first lady interacted with the American public and global leaders.

As you can imagine, the first lady received thousands upon thousands of letters, gifts, emails and other forms of communication.

Three other interns and I managed correspondence for the Office of the First Lady, as well as my supervisor and the director. We had a group of 24 outstanding volunteers who read each item of the first lady's mail and appropriately processed it. We might send a dozen autographed photos to a classroom or send a letter of encouragement from the first lady to constituents in need. We sent a lot of birthday greetings and thank you notes.

What was the most exciting or rewarding experience?

By far the most rewarding part of my job was being able to help those in dire need. We had access to every federal agency through our liaisons and were able to assist those seeking assistance.

I was able to help military veterans get medical care from the Veteran's Administration, find people somewhere to live through the Department of Housing

and Urban Development, get people healthcare solutions from health and human services and help people fight injustices and discrimination with the power of the Department of Justice.

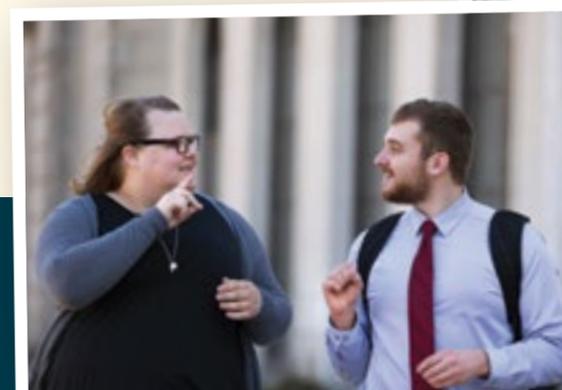
How will this experience help you meet your future goals?

Having "White House" on your resume is a pretty strong point! I crafted skills that will be relevant in any career path including leadership and team development, office management and internal and public communications.

In a broader view, I learned so much about public service and influencing positive change in our society. I participated in workshops led by public speaking experts, presidential speechwriters and government experts to learn how to engage and organize communities.

Above all, I want to continue to develop my skills and apply them to whatever future career I choose. Right now I'm focusing on my work with the MEANS Database—an online platform I lead that connects emergency food donations with local organizations in need.

If I learned anything about my future, it was discovering my North Star—what it is that guides me. For me, it's serving others and making people's lives better. 📌



Megan Johnson, American Sign Language interpreter, works with Kody Olson in a number of classes on campus and accompanied him to Uganda as he participated in the college's Center for Sustainable Rural Livelihoods internship program.



TAILORING THE STUDENT EXPERIENCE FOR VET SUCCESS

Story by Barb McBreen
Image by Christopher Gannon

Wielding a tool belt full of medical supplies, Patrice Sorensen vaccinates dairy cows at the Iowa State University Dairy Farm with the confidence and ease that comes with experience.

Sorensen, who graduated in May with an animal science degree, says she always knew what she wanted and strategically planned her college career to pursue her dream.

"I've been researching veterinary schools since I was in middle school," Sorensen says.

Her research and focus paid off. In February, Sorensen came closer to her dream of becoming a veterinarian when she was accepted into the University of Minnesota College of Veterinary Medicine.

"When I called my mom to tell her I had to hold the phone away from my ear because she was so excited," Sorensen says.

Joshua Selsby, associate professor of animal science and Sorensen's adviser, says he's not surprised.

"Patrice maximized all the opportunities from professional development to taking great internships with this goal in mind," Selsby says. "She's been an involved student and leader and has tailored her experiences to meet her goals."

Sorensen grew up in North Mankato, Minnesota, and was involved in 4-H. She didn't show animals, but always cared about animals. Her favorite animals are goats, so when she had the opportunity to intern at a goat farm she took it.

"I interned in New York at a goat farm with 80 goats and nine Alpacas," Sorensen says. "We did a lot of work in rotational grazing and processing fiber."

Her other internship experiences include working in public outreach at the Iowa State Fair with the Boulevard of Dairy Breeds and a study abroad experience in Ecuador.

"In Ecuador I gained experience vaccinating snakes and neutering dogs. It gave me practical experience and inspired me to do more international work," says Sorensen.

During the academic year, Sorensen says she walked around seven miles a day, three days a week for two years while working at the Iowa State dairy farm. She

collected tissue samples, cleaned stalls, drove a skid loader and vaccinated cows at the farm—she thrived on the variety and challenge of the work.

She was also an active member of the Alpha Sigma Kappa, a sorority for women interested in science, technology, engineering and mathematics (STEM). She served both as vice president of communications and operations in the sorority and in 2015 received the National Outstanding Leadership Award. Last summer she led a committee to organize the sorority's national convention in Des Moines.

Sorensen has received numerous scholarships including the Fred Foreman Scholarship for Growth in Leadership and Development, M. E. Ensminger Scholarship, Thomas and Esther Ringkob Memorial Scholarship in Animal Science, Alpha Sigma Kappa Pride of Epsilon Alumnae Scholarship, Award for Competitive Excellence, Presidential Leadership and 4-H Achievement.

When asked what she would tell others students about pursuing a dream, Sorensen says, "find as many opportunities and experiences as you can." 📖

Patrice Sorensen's work and internship experiences included the Iowa State University Dairy Farm, the Iowa State Fair and a stint in Ecuador where she learned to neuter dogs and vaccinate snakes.

ADDING VALUE, ADVANCING ENERGY

Story by Barb McBreen
Image by Christopher Gannon

Grant Ives is discovering ways to add value to ethanol production.

As an undergraduate in industrial technology, he's worked alongside researchers in the Iowa Grain Quality Initiative lab using Near Infrared Spectroscopy to analyze grain samples for protein, oil, fiber and fat content.

His internship has allowed him to make strides towards his real passion—making the world a better place.

"I want to leave the world a better place for my kids," says Ives. "I think I can do that by working with renewable energy."

Corn is a complex grain, Ives explains, with several products available to extract on both the front and back end of ethanol production. The work he is doing will implement ideas that add value to the process.

"We estimate how new forms of additional processing could increase the profitability of an ethanol plant by adding new products to sell from the same amount of corn," Ives says.

Charles Hurburgh, professor-in-charge of the Iowa Grain Quality Initiative, says

Ives' work is related to the dry grain milling industry. Dry grain milling processes 60 to 70 percent of Iowa's corn and is used in 90 percent of ethanol plants nationwide.

"Technological advancements will help corn ethanol meet the technical definition of an advanced biofuel. That's important because of the lower environmental impact of advanced biofuels," Hurburgh says. "With current corn surpluses and corn yield trends, we could get 20 percent of our gas in the United States from corn."

The internship broadened Ives' understanding of ethanol production. Ives already had extensive experience in industrial manufacturing through hands-on internships and coursework. He's excited about the future of manufacturing as a whole and says he sees some major changes in the future because of 3D printers.

"Right now manufacturing is a subtractive process and parts are carved out of blocks of material, but the industry is working towards 3D printing as an additive process to produce parts," Ives says. "It's booming."

Grant Ives, a May grad in industrial technology, wants to make the world a better place by advancing biofuel production. As an intern at the Iowa Grain Quality Initiative he worked to increase profitability of ethanol plants.

Ives began his career in civil engineering, after transferring to Iowa State from Des Moines Area Community College. However, he learned it wasn't the career he wanted to pursue and often shares his experiences as a transfer student from both another major and a community college with other students.

"As an older student, I have a lot of experience to share with students," he says. "I try to help them become adults. I encourage them to attend the career fair each year and learn to sell their strengths."

Ives is working to obtain a Green Belt Certification in Lean Six Sigma from the Management and Strategy Institute. The LEAN quality based certification is just another way Ives believes he can leave the world a better place.

"I'm continually learning new things and that's what I like about my major and this internship," Ives says.

After graduating in May, Ives began working with Land O'Lakes as a manufacturing management trainee, and in six months will move up to plant supervisor for a Purina Feedmill. 📖



SCIENCE OPENS DOORS TO EXPLORE

Story by Barb McBreen
Image by Christopher Gannon

Estefany Argueta is driven to learn. Her thirst for knowledge helped her acquire so many college credits she qualified as a senior when she entered Iowa State University two years ago fresh out of high school.

Argueta is continuing her adventure through courses like aquaculture, Taekwondo and an entomology class where she learned about different orders of insects and how they affect the world.

"I like to learn new things. I've always been curious and my family encouraged me to explore," she says. "All these classes are so interesting, I've learned things I would have never known."

Her adviser Amanda Chung ('12 animal ecology), says Argueta is pursuing two options in the animal ecology major: pre-veterinary and wildlife care and fisheries and aquatic sciences. Chung describes Argueta as dedicated and hard working.

"She'll get things done and she's going places," Chung says.

Chung says Argueta is always planning. This summer Argueta's spending time at the Iowa Lakeside Laboratory on Lake Okoboji and at the Tatoosh School in Alaska, a field camp hosted by Portland State University.

"I was born in Alaska and I can't wait to go there," Argueta says. "It's a field camp, so we'll be kayaking, camping and doing research—it's more hands-on learning."

*Iowa State's Science Bound program sparked a life-long love of learning for **Estefany Argueta**, which led her to develop diverse interests including turtle research, aquaculture, entomology, Taekwondo and ROTC.*

"I like to learn new things. I've always been curious and my family encouraged me to explore."

Military service is another area Argueta is exploring. She'll be the first in her family to serve in the armed forces. She joined the Iowa State's Army Reserved Officer Training Corp (ROTC) and says the program is developing leadership skills that she'll use as an officer.

"I have been challenged both mentally and physically," Argueta says. "I've always been interested in the military. These are great people and there are great opportunities."

Early intro to science

In middle school Argueta was introduced to the Iowa State University Science Bound program. The program reaches out to help underrepresented Iowa students in middle school and high schools pursue degrees in STEM (science technology, engineering and mathematics) fields.

The program piqued Argueta's curiosity and interest in science.

"There are so many things out there—I wish I could do them all," Argueta says. "I just want to explore every topic I can and I want to travel."

During high school she not only traveled and studied in Japan, but also found her way to an Iowa State turtle camp in Illinois. She says the two-week camp is why she chose animal ecology.

"We did research on turtles and I met graduate students and they talked about their experiences," Argueta says. "It was amazing to me that they did this for a living."

She's so enthused about the Science Bound program that she tutors incoming students. She promotes opportunities in agriculture and life sciences and advises students to take advantage of resources at Iowa State.

Spirit of Innovation, Service

In September, Argueta received the inaugural George Washington Carver Spirit of Innovation and Service Award from Iowa State University College of Agriculture and Life Sciences. The award is sponsored by the George Washington Carver Birthplace Association, a nonprofit cooperating association of the National Park Service at the George Washington Carver National Monument at Diamond, Missouri.

The award was presented to five students nationwide and is given to first-generation students pursuing science-related degrees. Argueta received the award based on her academic record and her science-based studies.

"No one in my family attended college and Science Bound helped me so much when it came to applying for college," says Argueta, who will be starting her third year at Iowa State.

Argueta's spirit of service inspired her to serve as a cultural ambassador with the Iowa State International Student and Scholars Office. During the spring semester she helped students from Iran and Canada explore Iowa.

"I'm learning about different places through that program," Argueta says. "I've been introducing my friend from Iran to Hispanic food and that's been really fun and interesting."

Along with her Science Bound scholarships, Argueta received a George Washington Carver Scholarship and the Multicultural Dean's Scholarship.

After graduation Argueta will serve in the military and pursue a career working with wildlife. Her goal is to work at an aquarium, zoo or wildlife refuge, but she is also considering furthering her education at graduate school. 📖

VOICES

AGRICULTURAL STARTUP ECOSYSTEM

Story by Kevin Kimle
Image by Christopher Gannon

As I complete my 16th semester at Iowa State University, I can't help but reflect at the simple power of bringing good people together.

Last December, Iowa Staters Joe ('86 agricultural business) and Karen Kerns kindly opened their beautiful home in rural Boone to host Agricultural Entrepreneurship Initiative students, alumni, supporters and others involved in the agricultural entrepreneurship community for a holiday party. It was a delightful time for fellowship, idea sharing and making new friends.

'Ecosystem' is used in many ways, but I think it is an appropriate term to use for the community that is being built by the Kerns and those like them who engage the Agricultural Entrepreneurship Initiative. Each year we ask for help from so many great friends for mentoring, interviews, panelist duty and other ways of engaging with students and others on campus.

Now that ecosystem is sprouting new vines off-campus in a number of ways including the market-changing businesses launched by past and current students engaged in the initiative. A survey of ISU alumni conducted in 2008 showed that 20 percent of College of Agriculture and Life Sciences (CALs) graduates from 1982 to 2006 had started a business, averaging 12 employees per business. I fully expect the next generation of ISU CALs graduates to have an even bigger impact.

A small sample of businesses started by students who were/are active in the Agricultural Entrepreneurship Initiative:

- AccuGrain, grain measurement—Ryan Augustine ('12 agricultural studies)
- Eagles Catch, aquaculture—Joe Sweeney ('13 agricultural business)
- KinoSol, food dehydration—Ella Gehrke, Elise Kendall ('16 global resource systems, environmental studies), Clayton Mooney ('16 global resource systems), Mikayla Sullivan ('17 global resource systems)
- ScoutPro, precision agricultural—Michael Koenig ('12 agricultural and life sciences education), Stuart McCulloh ('13 agricultural and life sciences education), Holden Nyhus ('13 agricultural and life sciences education)
- SmartAg, farm equipment robotics—Colin Hurd ('13 agricultural studies)
- Terva, agricultural land sales software—Steven Brockshus ('17 agricultural and life sciences education)

In 2016, we helped launch the Ag Startup Engine, a program in the ISU Research Park to identify and fund innovative agricultural startups (read more on page 15). Because of our rich network of entrepreneurs and agribusiness leaders, the launch of this business startup program is a very natural and significant progression of our support of agricultural entrepreneurs.

Entrepreneurial places and industries have a cultural element that sets them apart. There's a vibe, an energy and a dynamic that supports and encourages entrepreneurial behaviors. That entrepreneurial culture is expressed now in the agricultural startup community by support for aspiring agricultural entrepreneurs and an action-orientation among industry professionals and organizations for championing new ideas.

That action is making an impact and is important to the future of agriculture and Iowa. Analysis from the Kauffman Foundation shows that 80 percent of net job creation in the United States since the 1970s results from new businesses. If we imagine a more dynamic future for agriculture and Iowa, startups must be a part of it.

We have alumni who've been out of school for a few years now working on their first startup. We have current students partnering with past students on new businesses. And we continue to have so much help from seasoned business professionals and entrepreneurs in creating new opportunities. The network of great people who support the Agricultural Entrepreneurship Initiative is an expression of the vibrancy of the agricultural startup community and represents the evolution of a dynamic agricultural startup ecosystem. 📍

Kevin Kimle is the Rastetter Chair of Agricultural Entrepreneurship, Director of the Agricultural Entrepreneurship Initiative and senior lecturer in the Department of Economics.

With mentorship from the Agricultural Entrepreneurship Initiative's Kevin Kimle (left), Steven Brockshus (center) created Terva, an online marketplace for farmland. They discuss next steps for the business with fellow CALS grad Mikayla Sullivan, co-founder of KinoSol, an Iowa-based startup specializing in mobile, solar dehydrators.

REVVING UP FOR INNOVATION

Story by Melea Reicks Licht
Image by Christopher Gannon

Steven Brockshus knew he had a good idea.

He was in Japan on an agriculture tour with his fellow National FFA officers during their international experience. Hosts from the U.S. Embassy explained that one million acres of productive farmland was out of production because current owners weren't interested in cultivating the land.

That's when "the wheels started turning," Brockshus says.

Brockshus ('17 agricultural and life sciences education) created Terva, an online company serving as a marketplace that aggregates farmland real estate data and presents it to clients in a simple, map-based web interface.

He fleshed out his idea as a class project for Agricultural Entrepreneurship (Economics 334) and discovered his idea promised to strike the right chord every entrepreneur wants—commercial relevance.

Commercial relevance

Brockshus was granted the selective Murray Wise Associates Agriculture Entrepreneurship Award providing \$10,000 of seed funding for his idea. He earned a proof of commercial relevance award from the Iowa Economic Development Authority and was close to qualifying for the award's one-to-two matching grant. To help make his dream a reality, he needed \$2,500 in additional capital.

That's when he turned to his Economics 334 teacher Kevin Kimle ('91 MS economics), director of the Agricultural Entrepreneurship Initiative in the College of Agriculture and Life Sciences.

"Rather than providing the incremental funding to make the match, I challenged Steven to go out and get it," says Kimle. "He entered the TS Bank small business pitch competition event, REV in December."

Brockshus earned \$5,000 at REV for his Terva pitch and had the match he needed to secure \$25,000 from the Iowa Economic Development Authority.

Iowa State grad Michael Guttau ('68 farm operations) is chairman of the board

“The Ag Startup Engine is a key piece of an emerging, vibrant ecosystem for agricultural entrepreneurs.”



Contributed photos

One of the first portfolio businesses in the Ag Start Up Engine was co-founded by CALS grad Dane Kuper. Performance Livestock Analytics uses a precision agricultural application to help livestock producers efficiently measure and manage activities and inventories.

of TS Bank and his son Joshua ('99 animal science) is CEO. Their goal for REV is to ignite small businesses.

“Kevin and Dave Krog (the initiative’s entrepreneur-in-residence) helped prepare me for opportunities like REV, sharing their experiences and advice,” Brockshus says. “They encourage me to keep putting myself out there over and over again. If one door doesn’t open then I just keep working, and another opens.”

The doors are open at Terva, and Brockshus is hiring interns of his own. He’s building up to 5.5 full-time-equivalency positions this summer. Terva’s subscription service for landowners and agricultural realtors also is growing. They’ll soon expand their data offerings beyond Iowa to include Nebraska, Minnesota, Illinois and Indiana. It’s just one more step to his ultimate goal, Brockshus says.

“The big dream is to expand our offerings nationwide,” he says. “We’ll keep focusing on software to create new ways to work with data to alert buyers of land for sale, to share equitable sale prices and help both sides get better access to data about the land market.”

Start your engines

A new initiative in the Iowa State University Research Park was launched

with the support of the Agricultural Entrepreneurship Initiative in 2016—the Ag Startup Engine. The aim is to rev up innovation in agriculture by identifying and funding innovative agricultural startup businesses that originate with college students’ ideas, like Terva, and others outside Iowa State.

“Because of our rich network of entrepreneurs and agribusiness leaders, the launch of this business startup program is a natural progression of our support to entrepreneurs,” says Kimle.

The private-sector entity provides agricultural entrepreneurs—including Iowa State students, faculty and staff and non-university entrepreneurs—a means of moving from an early business concept to an investment-ready business.

“The Ag Startup Engine is a key piece of an emerging, vibrant ecosystem for agricultural entrepreneurs,” Kimle says.

Ag Startup Engine is governed by a small number of investors, which include Ag Ventures Alliance, Summit Agricultural Group, Ag Leader Technologies, Hertz Associates/Hertz Farm Management, Next Level Ventures, Renew Rural Iowa, Ag Ventures Alliance and Peoples Company.

It’s located in the Iowa State University Research Park and partners with a broader Iowa State initiative, the ISU Startup Factory.

The Ag Startup Engine provides a range of support to entrepreneurs:

- mentoring
- funding for product and business development
- access to facilities and equipment
- prototype development assistance and access to technical expertise
- a structured pathway to obtain additional funding

“This program helps identify the next generation of innovators and leaders in agriculture and we are so pleased to be part of it,” says Al Myers, founder and president of Ames-based Ag Leader Technology, a technology innovator of precision agriculture hardware and software. “Entrepreneurs will shape the future of agriculture, and we look forward to supporting development of the technologies and businesses they create.”

Kevin Maher ('74 animal science), founder of GlobalVetLink, PetMeasure and Maher Technologies, has played a lead role in development of Ag Startup Engine.

“More than 15 years ago, I founded my first business in the ISU Research Park,” Maher says. “I am excited to help continue to build a startup environment at the ISU Research Park that makes it a destination for high-impact agricultural entrepreneurs.”

Jude Conway, executive director of Ag Ventures Alliance of Mason City, says, “Ag Startup Engine is a great fit for our organization and our business development for value-added agricultural ventures.”

producers efficiently measure and manage activities and inventories.

Balsley and Kuper established an Ames office to leverage the relationships through the Ag Startup Engine and to source talented interns to contribute to their team.

“Our presence will enable us to engage interns more effectively as well as attract full-time employees as our team grows,” says Balsley, the company’s chief operating officer.

“It’s a great opportunity for us to be a part of the Ag Startup Engine and ISU Startup Factory,” says Kuper, the chief executive officer. “It provides a platform for continued growth of our business and the support we need to scale up in the agricultural technology space.”

Balsley and Kuper’s business was named one of the semi-finalist teams in the American Farm Bureau’s 2017 Rural Entrepreneurship Challenge. The pair also was awarded the top prize of \$25,000 in the 2016 Pappajohn Entrepreneurial Venture Competition and the \$25,000 Proof of Commercial Relevance grant from the Iowa Economic Development Authority.

“The Ag Startup Engine aims to provide businesses like Performance Livestock Analytics with access to networks and resources helpful to their continued growth,” says Kimle. “Dane and Dustin have done a fantastic job of launching their products into the beef industry. We look forward to supporting them as their business grows its customer base.”

Next steps for ag entrepreneurs

The Agricultural Entrepreneurship Initiative was established in 2005 in the College of Agriculture and Life Sciences to broaden understanding of entrepreneurship among faculty and students in the college. The initiative provides educational experiences to develop students’ entrepreneurial skills and increase interaction among students, faculty and agricultural entrepreneurs.

The American Farm Bureau Federation’s Rural Entrepreneurship Challenge is a national business competition focused exclusively on rural entrepreneurs working on food and agriculture businesses.

The first two of these competitions were won by Agriculture Entrepreneurship Initiative alumni: Michael Koenig ('13 agricultural and life sciences education), Holden Nyhus ('13 agricultural and life sciences education) and Stuart McCulloh ('13 agricultural and life sciences education) of Scout Pro in 2015; and Ryan Augustine ('12 agricultural studies) of AccuGrain in 2016.

In 2017, two semi-finalists for the honor also had ties to the initiative, Performance Livestock Analytics and Inland Sea.

To build on this record of success the initiative plans to expand offerings to engage students in developing entrepreneurial skills and businesses.

“I think we’re still trying to catch up to students in terms of their desire for classes and experiences that help them think, behave and exercise the skills of an entrepreneur,” says Kimle. “Entrepreneurship is a life skill that is important if starting a business, but those same skills can be applied to making an impact in non-business ways too.”

New courses, experiential learning opportunities and engagement opportunities will be rolled out by the initiative in the next few years.

“The goal is to build students’ entrepreneurial capacity,” says Karen Kerns, CEO of Kerns and Associates and chair of the Agricultural Entrepreneurship Initiative’s Advisory Council. “Entrepreneurship is more than one idea, product or project. It’s a way of thinking, innovating and impacting.”

STORIES EXTRA: www.stories.cals.iastate.edu

The Ag Startup Engine launched by the Agricultural Entrepreneurship Initiative has already proven successful for three companies: Performance Livestock Analytics, SmartAg and Gross-Wen Technologies. Learn more about these successful ventures online.

PROCESSING SUCCESS

IOWA STATE'S INDUSTRIAL PLAYGROUND

Story by Ed Adcock
Images by Christopher Gannon and Center for Crops Utilization Research

The Center for Crops Utilization Research, along with the Bio-Century Research Farm, provide companies from around the world access to processing and production systems to help take their ideas to the next level.

"Many companies have pilot plants, but they are focused on process improvement and are set up to mimic their large-scale manufacturing. Our facility is a playground where they can come and explore new ideas," says Kevin Keener, director of the two facilities.

Tucked in the Food Sciences Building on the Iowa State University campus, the center offers equipment ranging from lab to pilot plant to pre-commercial scales. It could be considered one of Iowa State's hidden treasures.

"I feel like, what we're doing here can change the world," Keener says. "Most people don't know we're here and those who do, don't realize all the impact we have."

Iowa focus, global client base

More than 50 companies used the Center for Crops Utilization Research (CCUR), or its affiliated BioCentury Research Farm (BCRF) over the past five years, generating an economic impact of \$118 million in Iowa.

About half of CCUR's clients are based in Iowa, which helps support the center's goal of diversifying the economy in the state. Iowa State's Center for Industrial Research and Service is a valuable partner that steers Iowa companies to CCUR.

CCUR has more than 260 pieces of manufacturing equipment that can be configured into integrated systems solutions depending on the needs of the faculty or industrial client. CCUR encompasses 14,000 square feet of lab and pilot-plant space to accommodate companies ranging from start-ups to multi-national corporations.

The center was created more than 30 years ago to increase the use of Iowa crops, which is still a primary focus, Keener says.

"We look at corn and soybeans as an input into all these other opportunities. We don't just look at them as an agricultural product to feed to animals or make ethanol. The intent is to connect with companies to make value-added products because those products provide a 10-to-1 mark-up on revenue," he says.

Ideas to implementation

Des Moines-based Kemin Industries had an idea for a new botanical extraction and wanted to evaluate its functionality. To test the feasibility of their idea Kemin turned to CCUR.

"What you want with any pilot is to mimic what will happen in real production. You can do extractions in the lab, but you need to see if it will work in reality, at a larger scale," says William Schroeder,



Far Left: Kevin Keener (left) and Darren Jarboe help companies from around the world test processing and production ideas at the Center for Crops Utilization Research. The center's expertise and equipment cover a wide range including the impact of light on meat in retail displays and corn and soy processing for targeted use.

director of research and development for Kemin's food technologies division, which markets ingredients that increase the safety and quality of food products.

The company develops some ingredients based on herbs, such as rosemary and spearmint. It wants as much pilot-scale information about growing, harvesting and extracting before actual production.

That's where CCUR came in.

"CCUR is convenient since it is close. The availability is great; it seems like we can get in on pretty short notice because they can accommodate multiple groups. As far as equipment, they have a wide range of equipment that we can work with," says Schroeder.

Schroeder says Kemin received enough material from CCUR tests to perform larger pilot application studies on its extraction process, and can better estimate the cost of the process. Optimization is still to be done, and CCUR may enter the picture again.

Human capital, high tech

Schroeder says for Kemin, CCUR's knowledge base is a major draw.

"Hui Wang (the pilot plant manager) and his staff know their equipment and having that assistance helps clients," Schroeder says.

Wang says he enjoys working through clients' production challenges.

"I have the chance to help technologies move from bench top through pilot scale to commercial scale, troubleshoot the technical issues and help Iowa companies and beyond generate more jobs," he says.

CCUR also offers new businesses needed facilities and experience to develop their ideas.

Wang's team worked with Nutriati Inc., a Virginia-based company that makes plant-based ingredients from chickpeas and other crops used to boost the protein level of foods or create gluten-free products.

"For a start-up business like ours, it is critical to have access to a pilot plant with the capability to adapt to specific, custom engineering and processes," says Michael Spinelli, the company's co-founder and chief technology officer. "Our team was very pleased with the facility layout and the many process capabilities available on site."

Diverse expertise, equipment

CCUR offers a variety of technologies that commercial research and development departments may need. Many seek information about fermentation from two staffers who have 50 years combined experience with several microorganisms.

Drying technology is another area of emphasis. The center houses eight types of drying technologies that affect the structures of finished products in different ways. Several kinds of grinding systems also are available to handle the qualities of a wide range of materials.



Left: Scientist **Bill Colonna** draws a sample from a 50-liter fermentor in the Center for Crops Utilization Research. The center offers a variety of technologies commercial research and development departments may need, including fermentation. Right: **Hui Wang** (left), manager of the pilot plant in the center, and food science professor **Lester Wilson** (second from left) often include students in research teams in the center including **Ethan Wiegler** (right).



“A lot of these companies don’t have the diversity of equipment. They can come in here and do the work for a few thousand dollars compared to an investment of a couple hundred thousand for a piece of equipment. That’s the driver for a lot of companies,” Keener says.

Large companies with extensive research and development facilities still seek their help, says Darren Jarboe (’85 ag business, ’86 agronomy, ’12 PhD industrial and ag technology), CCUR’s program manager for technology commercialization, marketing and communication.

“Multi-national companies are innovating all the time and sometimes they like the idea of getting away from the company headquarters and trying new things in an entrepreneurial environment with an extensive assortment of equipment resources and expertise,” he says.

Next gen scientists

Students and faculty researchers are a necessary part of CCUR’s success.

The Iowa State faculty affiliated with the center is a draw for companies, allowing them to access world-class expertise without leaving campus. More than 50 faculty and researchers from departments including food science and human nutrition, agricultural and biosystems engineering and a dozen other departments work with CCUR clients.

Faculty also supervise student research projects in the center. Labs for food processing, food technology and ag and bioengineering students originate in CCUR.

“The equipment we have gives students hands-on exposure to the latest and greatest in terms of technology. In some cases we have students who are part of

these research teams. Our assistant pilot plant manager, Ethan Wiegler, is a senior in agricultural systems technology,” Keener says.

Wiegler helps design and set up experiments, maintains equipment and acquires supplies for projects. “I interact with clients, faculty, graduate students and undergraduate students helping to identify their processing needs and how we can help them,” he says.

The experience has given him the opportunity to learn about the food processing industry and network with clients, making contacts for after graduation.

“The knowledge and real life experience I have gained from this job will serve me just as well if not better than the knowledge I have gained in the classroom,” Wiegler says

Keener says there are currently 10 senior design project and product

development teams using the center. CCUR staff help teach undergraduate and graduate courses in areas including food product development, food processing, pet food processing, food analysis and grain processing and handling.

Keener wants to expand training programs for companies using the center including workshops in food safety training, regulatory compliance,

“The knowledge and real life experience I have gained from this job will serve me just as well if not better than the knowledge I have gained in the classroom.”

packaging and recycling. Last year, it hosted a session on the use of ultrasonics—the use of acoustic vibrations to improve materials and industrial processes—in food processing.

An upgrade to the existing CCUR Technology Transfer Theatre could allow participants to view pilot-plant operations by video, and be broadcast online to sites around the world. It is difficult to view equipment for groups gathered around it, but a camera could put workshops into the pilot plant wherever they are.

“I’ve done a lot of training programs for USDA and FDA inspectors as well as private industry tailored to different company needs, and I see a tremendous opportunity there,” he says.

When he was hired in 2015, Keener says the message he got was to diversify the economy in the state. The variety of projects at CCUR shows it is achieving its goal. 📍

Center for CROPS UTILIZATION RESEARCH

Last year, the center helped 30 companies test their ideas for dozens of projects, which varied according to their imaginations. Here are a few highlights:

- Performed an ethanol fermentation using corn-based feedstock materials and delivered the samples taken for analytical testing as well as the final whole stillage product.
- Extruded algae biomass, biochar, soy flour and polylactic acid into controlled release fertilizer pellets.
- Manufactured grits from soybeans and made soy milk as well as conducted analytical testing.
- Trained startup company personnel on the safe operation and use of fermentation equipment and assisted them with conducting a pilot-scale fermentation that gave broth containing the desired product.
- Conducted pilot-scale feasibility tests on drying corn ethanol products.
- Ground and milled flowers to test different processing options.
- Extruded, dried and packaged animal feed supplement samples.

Lisa Lorenzen, executive director of the ISU Research Foundation, says location is a big factor of the research park's success. She works with Steve Carter, president of the ISU Research Park, to negotiate contracts and provide commercialization services to the 60-plus tenants including Boehringer Ingelheim, Vetmedica, Vermeer, John Deere, Merck, Workiva and many others.

Story Ed Adcock
Images by Christopher Gannon

LASTING CONNECTIONS

ISU RESEARCH PARK BOOSTS LEARNING, ECONOMIC DEVELOPMENT

Five years ago, Sara Hunter moved from Vermeer Corp. headquarters in Pella, Iowa, to the Iowa State University Research Park in south Ames.

Hunter ('06 animal science) oversees the day-to-day partnership between Iowa State and Vermeer, a family-owned and operated manufacturer of agricultural and industrial equipment.

"The proximity to campus is a benefit to students and our team members. The ability to allow students to work on real-world projects while they're continuing to go to school is a big piece of it," she says. "Being able to collaborate with the university and recruit technology-based talent is key."

After outgrowing their original space, the research park constructed the Vermeer Applied Technology Hub in 2016 and leases it to the company.

"The new multi-use building includes labs, offices and an equipment high-bay to allow our team members and Iowa State students and faculty to work side-by-side on technology advancements of Vermeer equipment," Hunter says. "The building fosters an environment for software engineers to excel in the development of practical, affordable and modular equipment technology."

Campus collaborations

Hunter builds relationships with staff, faculty, students and the Ames community to complete projects and build brand awareness for Vermeer. That includes supervising a crew of students, handling technology needs for the office and planning events. She also serves as an adviser to the College of Agriculture and Life Sciences Student Council, volunteering her time to meet with the club and offer industry guidance to its members.

Edan Lambert, a junior in animal science and president of the college's student council, spent this year as part of the Vermeer International Leadership Program. She found it so valuable that she added leadership studies as a minor.

A study abroad trip last January took her to the Netherlands where her leadership studies class visited several organizations including the Vermeer EMEA (Europe, Middle East and Africa) regional office. For spring semester, a group project in her global leadership course included regular video chats with a representative from Vermeer-Brazil to learn about Brazil's culture and its environmental issues.

"While I have already gained so much from being a part of this program, I hope to gain a better understanding of leadership on a local, national and cultural level," Lambert says. "I also want to be more equipped from a cooperative standpoint so I can be a better employee and colleague in the future."

New building, new partnerships

After moving into the new building last March, Vermeer was joined by several tenants. Colin Hurd ('13 agricultural studies), founder of Smart Ag, jumped at the chance to move his start-up into the building.

"One of the big needs for Smart Ag in automating farm equipment is a facility that we can pull equipment into and work on. This building is ideal for that because they have a huge bay downstairs, and we've been able to lease a little bit of space for that. We can pull our tractor in to work on it, and have our office upstairs," he says.

The Vermeer-Smart Ag relationship is just one of many agricultural connections at the research park—more than 40 percent of companies in the park are related to agriculture.

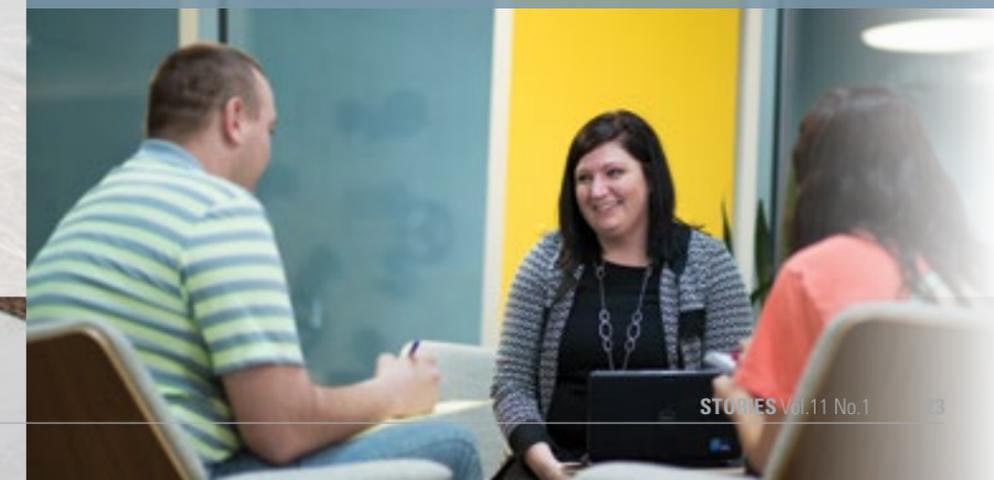
Like Hurd, several College of Agriculture and Life Sciences alumni, faculty and students are taking what they discover in labs and classrooms to strike out on their own and create businesses. New enterprises are filling several buildings going up at, and around, the research park.

Magnet for large and small firms

The Iowa State University Research Park is a 400-acre development with more than 650,000 square feet of current building space located just south of the Iowa State campus. The park helps international companies like John Deere, Boehringer Ingelheim, Vetmedica and Merck, as well as startups looking to deepen their relationship with the Iowa State research enterprise and talent pipeline.

"We connect our tenants with the resources they need to grow their business; whether that is talent, the research infrastructure at Iowa State, specialized facilities and equipment, business development expertise or financing," says Steve Carter, president of the Iowa State University Research Park and director of the Iowa State University Pappajohn Center for Entrepreneurship.

Capitalizing on their presence in the Iowa State University Research Park, Sara Hunter builds relationships for Vermeer with staff, faculty, students and the Ames community to complete projects and build brand awareness.



Martin Gross, left, and Zhiyou Wen take a sample of algae in the portable algae water-treatment unit. Their business, Gross-Wen Technologies located at the research park, is commercializing an algal wastewater treatment technology developed in partnership with Iowa State.

“Many of the park’s more than 60 companies are agricultural, and several are led by ag and life sciences alumni or faculty.”

The spirit of entrepreneurship is strong in the College of Agriculture and Life Sciences and in agriculture, says Carter. “Many of the park’s more than 60 companies are agricultural, and several are led by ag and life sciences alumni or faculty.”

For example:

- VariFAS Biorenewables LLC was cofounded by a team of researchers including agriculture and life sciences faculty members Basil Nikolau and Marna Nelson. The company’s goal is to produce biorenewable chemicals economically, help partners create environment-friendly products and contribute to building a bio-based sustainable chemical industry.
- Pat Schnable (’86 PhD agronomy), Charles F. Curtiss Distinguished Professor in Agriculture and Life Sciences, is managing partner of Data2Bio LLC, that helps clients on six continents with projects ranging from mapping and cloning individual genes to designing and conducting multiyear plant breeding programs relying on genomic selection.
- Nathan Davis (’15 food science, global resource systems) is the founding partner of Ideopak, which provides customized packaging solutions for food and pharmaceutical companies.

Many companies navigate to the research park after forging relationships elsewhere on campus, usually through research.

Deere is setting up a research and innovation center collaborating with, among others, Matt Darr in the agricultural and biosystems engineering department. Darr, who was recently named to the Kinze Manufacturing Fellowship in Agricultural and Biosystems Engineering, has conducted several projects with Deere, many dealing with biomass harvesting equipment at Iowa State’s BioCentury Research Farm (BCRF).

Gross-Wen Technologies is commercializing an algal wastewater treatment technology developed at the BCRF and the Center for Crops Utilization Research. It has offices at the park and is part of the Iowa State University Startup Factory and Ag Startup Engine (read more on page 15). Martin Gross (’11 biology, ’13 MS food science and technology, ’15 PhD ag and biosystems engineering, food science and technology) is a co-founder with Zhiyou Wen, a food science and human nutrition professor.

In the right place

Location is a big factor of the park’s success, says Lisa Lorenzen (’89 genetics, ’94 PhD genetics), a member of the

research park’s board as well as executive director of the Iowa State University Research Foundation (ISURF) and director of the Office Of Intellectual Property and Technology Transfer, which have offices at the park.

Lorenzen’s offices negotiate research contracts between Iowa State researchers and industry, and provide commercialization services, including those related to protecting and marketing intellectual property.

“Research park companies have licensed technologies from ISURF, negotiated research contracts with us and have been helped through introductions to other units and resources,” Lorenzen says. “We also work with the startup companies (at the park), primarily from an intellectual protection and licensing standpoint.”

“One of the key strengths of the research park is its location: we are in a rural environment, surrounded by some of the richest agricultural resources in the world, both in terms of intellectual capital and landscape. The research park is uniquely positioned to help companies and entrepreneurs take advantage of that infrastructure,” Carter says. “We’ve grown to a point that we have some critical mass, and imagine that in the next 20 years, even more companies with agricultural ties will call the research park home.”



The Local Foods Program sponsors an annual Local Foods Festival on campus in the fall, with vendors lining the walk between Curtiss and Beardshear Halls. Nearly 2,000 students and staff visited the booths in 2016.

KEEPING IT FRESH

LOCAL FOODS DIVERSIFY, BOOST PROFITS

Story by Leigh Adcock
Images contributed

Farmers are a curious and creative bunch, always on the lookout for ways to diversify their income stream and improve their bottom line.

Match that with a concern for the health of their communities and a nose for a developing market, and the result is a growing local foods economy benefiting producers, consumers and the entrepreneurs who connect them.

Far from typical

Greg Rinehart (’74 animal science) and his wife Polly have raised 10 children on their 800-acre farm northwest of Boone, Iowa. The farm has put every one of their kids through college (the majority at Iowa State). But it’s not your typical Iowa grain farm.

Back in the 1980s, when the ag economy was floundering, Greg and Polly took a hard look at their 20-year-old commodity farm business and took a risk.

“We were growing corn, soy, cattle and hogs, and losing money on all of them,” Greg says.

In 1988, RAGBRAI passed by the farm, and a neighbor suggested Greg should raise sweet corn to sell to the hungry riders. The following year, the family began raising vegetables on about two acres for the brand-new Boone Farmers’ Market. Nearly 30 years later, the farm produces sweet corn and early peas on 400 of its acres, for sale to Birds Eye Vegetables for its microwave frozen food line. They still produce corn and soybeans on 400 acres.



Greg and Polly Rinehart grow fruits and vegetables in addition to corn and soybeans, which Greg says helps with cash flow and soil health. They sell to Birdseye Vegetables and at the Boone and Des Moines Downtown Farmers' Markets.

The Rineharts also are raising, “just about any vegetable you can grow in Iowa” for sale at the Boone and Des Moines Downtown Farmers' Market.

Greg credits Iowa State faculty and staff with ongoing technical assistance and support, and names Ajay Nair, professor of horticulture, and the staff of the horticulture station as especially helpful. He looks forward to passing on the farm to his son Daniel in due time.

He's got a bit of advice for other farmers looking to diversify into horticulture. “We started slow, and that's the best plan,” Greg says. “Grow the things you like to grow, and that will sell. You can expand your business from there.”

Growing impact

The most recent statewide survey data collected by Iowa State University shows farmers like the Rineharts are contributing to Iowa's growing horticulture industry. In 2015 horticulture generated \$48.3 million in direct sales, of which \$32.1 million are payments to value-added enterprises (including labor income, returns to farm owners and investors and tax payments). Of this, 503 jobholders earned \$21.4 million in labor income, which is earned and spent locally.

The potential exists for even more growth. Iowans spend more than \$8 billion on food each year, of which only about 14 percent is grown in the state. Research by Iowa State University economist David Swenson indicates increased production of fruits and vegetables could result in a corresponding increase in jobs and income for many Iowans.

In response to this opportunity, Iowa State has ramped up its investment in local food systems statewide by creating a local foods program within extension and outreach. Its staff of 10, under the direction of program manager Craig Chase ('80 MS agricultural economics, '94 PhD rural sociology), supports local food systems in a number of ways.

The program offers the following resources:

- leadership training and professional development
- research-based, needs-driven tools and publications
- evaluation services and training
- facilitation and outreach services
- support for youth education in gardening and nutrition
- help building diverse coalitions and partnerships, locally and statewide

The 20-some local food systems practitioners currently serving 84 of Iowa's 99 counties attest their work is benefiting their communities in multiple ways.

“Growing for local markets can provide a lower-cost point of entry into agriculture for beginners than larger scale, commodity-market farming,” Chase says. “Local food systems create other business opportunities for distributors and aggregators, keep dollars circulating in the community, give commodity growers a means of diversifying their income and help children and families connect to healthy, local food products.”

Adding value on farm

When Jill and Jeff Burkhardt of Picket Fence Creamery built a grade-A bottling plant at their 80-acre dairy farm near Woodward, Iowa, in 2003, they were aiming to bring some balance to their family life.

“Jeff and I both had fulltime jobs off-farm and had the dairy farm as well,” Jill says. “We needed to find a way for the dairy to make money on a stable basis, or stop the dairy and do our jobs in town. We both decided we wanted to keep the farm going, make it sustainable for us, and make a living for our family.”

The Burkhardt family, James, Jill, Jeff and Jenna (left to right), built a bottling plant at their 80-acre dairy farm near Woodward—Picket Fence Creamery. They teamed up with professors at Iowa State to involve students in producing their business plan and marketing and feasibility study.



CALS grads Ellen Walsh-Rosmann and her husband Daniel Rosmann created FarmTable Procurement and Delivery in Harlan, Iowa, to meet a growing demand from local chefs for fresh products.



The timing was right for a value-added dairy business in the central Iowa area, so Picket Fence Creamery stepped in to meet demand for a local dairy product line and has continued to grow with consumer demand.

With several Iowa Staters in the family, the Burkharths turned to Iowa State University for assistance. They worked with students to produce a business plan as a team project, and another class did a marketing and feasibility study for the creamery.

The family-run creamery was bottling all of its own milk within the first nine months of operation. Since selling its first bottles of milk in the Perry HyVee, the creamery has grown to produce and distribute milk and chocolate milk, cheese and 30 flavors of ice cream to 80 locations statewide. They also sell their own beef and around 100 locally made food products from other vendors in their farm store.

Stephanie Clark, professor of food science and human nutrition at Iowa State, noted on-farm processing is a great way for small farmers to add value to their agricultural products—an important advantage in today's marketplace.

“It's difficult to make ends meet by just raising animals for milk production and sale of fresh milk,” Clark says. “Farmers can recoup more of their investment and have the creative satisfaction that on-farm value-added processing provides.”

Connecting farm to table

FarmTable Procurement and Delivery of Harlan, Iowa, is an aggregator and online marketplace of locally produced foods. Ellen Walsh-Rosmann ('09 public service and administration in agriculture, international agriculture) and her husband Daniel Rosmann ('05 agronomy) created the business in 2013 to meet a growing demand from local chefs for fresh products. Business has boomed, and now includes a crowd-funded delivery truck, a growing staff and a business park location for aggregation and storage.

FarmTable distributes products from about 45 farmers to 80-90 buyers such as chefs, grocery stores and buying clubs in the Omaha, central Iowa and Cedar Rapids/Iowa City food sheds.

“As a farmer, I know it isn't easy to sell and scale up a farm for the wholesale market,” Ellen says. “We started FarmTable to help our farmer friends.”

Danelle Myer is one of those friends—the owner-operator of One Farm, a small vegetable business near Logan, Iowa, and a satisfied FarmTable client.

“What I appreciate most about FarmTable is the way its system allows me to not only stay on farm to grow, harvest and package orders, but it also allows us to reach markets and build customer relationships we would never have time to cultivate on our own,” Myer says.

Iowa State's Swenson suggests smart public policies connecting local farmers to large food buyers such as supermarkets, restaurants, hospitals and school districts could help grow midsize farms, creating jobs and boosting local economies.

Capitalizing on growing consumer demand for locally grown food is one way farmers may diversify. The Iowa State University Extension and Outreach Local Foods Program offers tools, resources and expertise to help along the way. 

STORIES EXTRA: www.stories.cals.iastate.edu

Find ISU Extension and Outreach local food resources and visit the farms featured online.

TRENDING UP

KEEPING TABS ON THE ECONOMICS OF EGGS

Story by Lesa Vold
Image by Christopher Gannon

With its plentiful supply of corn and soybeans, Iowa is at an advantage to capitalize on economic opportunities in the U.S. egg industry.



Maro Ibarburu is the national go-to expert for historical egg industry information, insight on the future of the flock and egg prices. Ibarburu is an associate scientist and business analyst for the Egg Industry Center.

Iowa egg producers started building on the state's value during the late 1990s and by 2001, reclaimed the state's past title as the number one egg-producing state in the nation.

Iowa has been the leader in egg production ever since, housing 49.3 million laying hens in 2016, producing an estimated 14 billion table eggs. According to the United States Department of Agriculture, Iowa's laying hen flock is nearly the size of the flocks located in Indiana and Ohio combined, the second and third largest respectively.

The individual who understands the industry's past and can offer insight into its future is part of the team at the Egg Industry Center located at Iowa State University.

Maro Ibarburu ('05 MS agricultural economics) works as the associate scientist and business analyst for the center. He didn't grow up with a fascination for eggs or chickens, though they raised some on his family's farm in Uruguay. He was drawn to Iowa State by the opportunity to learn and an interest and passion for economics. Ibarburu started his adventure under professor Brent Hueth and continued to work with others in agricultural economics.

"I expanded my knowledge of cattle production and marketing under John Lawrence, interim vice president for extension and outreach (then director of the Iowa Beef Center and professor of agricultural economics). I also learned a lot about pork production and marketing under James Kliebenstein, professor emeritus of economics. The education and support I got at Iowa State are priceless and will stay with me for the rest of my life," says Ibarburu.

Ibarburu definitely has learned, so much so that following graduation he earned a position as a poultry economist. And, he is now the go-to person nationwide for three things: historical egg

industry information, insight on the future of the flock and egg prices.

He continually analyzes data coming from the United States Department of Agriculture and other private sources to project what the future may hold for the industry. His efforts increase the accuracy of models used for reporting.

Forecasting markets is never an easy task, and it gets harder when the product doesn't have a tight correlation between price and consumption.

"The correlation between egg price and egg consumption is weak. In only nine out of the last 17 years the consumption and the price moved in opposite directions, whereas in the remaining eight years, the consumption and the price moved in the same direction," says Ibarburu.

"While we don't know the future, we do know some of the trade-offs that exist."

The industry relies on the information he provides.

"The knowledge that Maro has, and the information that he generates is invaluable and critical to us as producers and to our industry partners because we have to make important investment decisions that have long-term impacts," says Steve George, president and CEO of Fremont Farms of Iowa. "Maro is a key asset to the entire U.S. egg industry and we are lucky to have him in Iowa."

To help Iowans better understand the impact of the Iowa egg industry, Ibarburu helped co-author an Iowa State University Extension and Outreach publication titled *Economic Importance of the Iowa Egg Industry*. Updated periodically, this piece is used to help educate policy makers and others. Iowa Egg Council Executive Director Kevin Stiles says the publication has another use.

"Farmers use it when they meet with lenders and others when they look to grow or modify their farming or processing operations," Stiles says. "It is one of our go-to pieces."

Ibarburu also works as a collaborator on research projects and develops special reports on things like the market reaction to the High Pathogenic Avian Influenza outbreak in 2015, but ultimately he likes helping others the most.

"It is a fun job because sometimes I am helping a producer who has a question about the market reports, and other times I am helping a new allied industry person who is unfamiliar with egg production—like the one who started a job earlier this year for a company located in Des Moines," he says.

The Iowa egg industry has an underlying network of supporting companies, and Ibarburu considers collaborating with these industry partners essential for the industry.

Besides some educational opportunities, Ibarburu also has helped one such company determine the egg industry's capacity to sustain needed inputs for their operation. This information was used to determine if it was possible for them to locate within the state.

In response to industry needs and trends, he currently spends a considerable amount of time talking with those in the consumer food chain about the economic trade-offs of moving the industry to a cage-free production system.

"While we don't know the future, we do know some of the trade-offs that exist," says Ibarburu. "These include things like a bigger environmental footprint, increased disease pressure for the birds, and increased cost of production, which will increase prices on the grocery store shelf. One thing is certain, this industry is always changing and that means there is always something to learn." 

April Hemmes is a known and effective advocate for agriculture in Iowa from hosting international visitors on-farm to speaking on the changing role of women in agriculture.

MAKING HISTORY

HEMMES' TOP 5 TIPS FOR SUCCESS IN FARMING & LIFE

Story by Darcy Maulsby
Image by Joe Murphy

April Hemmes, a fourth-generation Franklin County farmer, has been called the epitome of women's empowerment in ag.

During her 32-year farming career, nothing has stopped Hemmes, known as an assertive, outspoken, ebullient ag leader who's more likely to wear a "Well behaved women rarely make history" shirt than a seed corn cap.

In 2016, Hemmes spoke at 10 conferences, including the Farm Progress Show; traveled to five foreign countries to discuss U.S. agriculture and sustainable crop production; conducted radio and television interviews with 12 media outlets; and hosted more than 30 visitors on her farm. Twenty of these visitors were from China, and four participants had the opportunity to drive Hemmes' combine during harvest.

Hemmes offers her top five tips for success in farming and life:

1. Mentors matter. Hemmes (82 animal science) credits her grandfather, Bert Hemmes, for encouraging her to farm, and her high school ag teacher, David Flint, for inspiring her to learn all she could about agriculture. This support

helped her thrive at Iowa State University, where only 5 percent of her fellow animal science students were female. Today, that number has risen to 75 percent.

2. When there's a roadblock, take a detour.

When the 1980s Farm Crisis made it tough to return to the farm, Hemmes accepted a job at a bank in Omaha. "Be willing to try new things," she says. "I've learned you have to do what's best for your farm and your family."

3. Leverage your contacts. As her career evolved, Hemmes became an Iowa State University agronomy department research assistant and later worked at the Iowa Swine Testing Station in Ames before serving as a legislative aide in Washington, D.C. for Iowa Congressman Jim Ross Lightfoot. "Never lose your contacts," Hemmes says. "Every job I had is because of someone I knew."

4. Start small, but pursue big dreams.

When Hemmes returned to the Hampton area to farm full-time in 1985, she

converted an old shed into a farrowing barn and raised 30 sows. As she modernized the operation, she bought her first piece of ground in 1996. Today, Hemmes owns approximately 1,000 acres of corn, soybeans and pasture land. "Even after 32 years, people still think my husband is the farmer," jokes Hemmes, whose husband, Tom Kazmerzak, has an off-farm job in Hampton.

5. Give back. Hemmes serves with the United Soybean Board, Iowa Soybean Association, Iowa Beginning Farmer Center Advisory Council, Franklin County Soil and Water Commissioner, Franklin County Farm Service Agency County Committee, Reeve Township clerk, 4-H Beef project leader and more.

"My dad was a member of the local extension council and my mom was a long-time 4-H leader, so early on I saw the value of extension and learned the importance of giving back," says Hemmes, who received Iowa State University's Women Impacting the Land award in 2016 for her conservation efforts. "I love working with people in agriculture, especially kids, and feel fortunate to be an Iowa farmer." 📖

Story by Melea Reicks Licht
Image by Christopher Gannon

TALKING POLICY STARTS WITH

SCIENCE

When Stephanie Carlson walks into the room to lead a discussion on federal policy she's well equipped to protect more than 6,200 Iowa hog farmers representing \$7.5 billion in annual economic activity.

Her ace in the hole? Science.

As producer outreach and federal policy director for the Iowa Pork Producers Association, Carlson monitors, researches and prioritizes federal policy issues. She recommends action to members, and builds strong relationships with policy-makers, government agencies and staff.

Carlson (13 animal science) says science and agricultural research are vital to her job.

"Agricultural research allows farmers to be competitive and protects the environment and human health," she says. "We use science and technology to back up our policy for the best interest of people, pigs and the planet."

The association is appreciative of partnerships with the Iowa State University College of Agriculture and Life Sciences, Carlson says, especially in their Foreign Animal Disease Preparedness Task Force. She leads the effort bringing together partners from across the industry to increase understanding of the State of Iowa Foot-and-Mouth Disease Response Plan and crisis management among pork producers.

"When we were dealing with PED (Porcine Epidemic Diarrhea Virus) and Avian Influenza struck poultry farmers, we realized the pork industry is at risk. It's not the most fun conversation, but it's important for producer success and the economic success of Iowa and the United States," Carlson says.

The task force recommends the USDA Animal and Plant Health Inspection Service expand their Foot-and-Mouth Disease vaccine bank to provide adequate coverage for all strains.

She plans to continue these conversations as part of upcoming Farm Bill discussions.

"Exports are not part of the Farm Bill, but go hand-in-hand with the Foot-and-Mouth Disease vaccine bank. Should we get the disease, exports would be shut down immediately. With about 25 percent of total pork production exported, that's a tremendous amount of product to be sitting on," Carlson says. Exports of Iowa pork totaled \$1.1 billion in 2015.

Carlson says she learned from the best at Iowa State, especially during her time working at the Swine Teaching Farm under the direction of Al Christian. Advised by professor Tom Baas, Carlson says those mentorships and relationships helped her find a career path and inspire her passion for the pork industry.

As producer outreach and federal policy director for the Iowa Pork Producers Association, Stephanie Carlson says she uses science "to back up our policy for the best interest of people, pigs and the planet."

She contributes her time and service to the college and to the agricultural industry. She's community relations chair for the Young Professionals in Agriculture networking group and a member of the Grow Iowa Agriculture advocacy organization.

Carlson was honored earlier this year with the 2017 College of Agriculture and Life Sciences Emerging Iowa Leader Award.

"From sharing her expertise with classes and student organizations, to advocating and raising awareness for college priorities through the Curtiss League and the Grow Iowa Agriculture organization, Stephanie has positively impacted the college and our students in many ways," says Wendy Wintersteen, endowed dean of the College of Agriculture and Life Sciences. 📖



PURSUIING QUESTIONS

Story by Melea Reicks Licht
Image by Christopher Gannon

Before Alan Barkema became senior vice president for the Federal Reserve Bank of Kansas City, he used to hang out at the coffee station on the third floor of Heady Hall.

Technically, it was in the hallway connecting East Hall and Heady Hall—where economics and sociology meet—where graduate students like Barkema would gather to discuss research, to support each other and tackle tough questions.

The coffee was average, but the conversation above par.

Barkema ('73 farm operations, '85 MS economics, '86 PhD) has always been driven by curiosity. He returned to his family farm near Alexander, Iowa, after

earning his master's degree at Cornell University, but his desire to learn brought him back to campus and to Heady Hall. That's where Earl Heady, distinguished professor, former chair and building's namesake, encouraged him to get serious about his studies and consider a career in academia.

"Iowa State is a great place to pursue questions," Barkema says. "When the 1980s farm bust came I was working with Bob Jolly and William Edwards in extension. I was fascinated with what happened to farmland values. I was a number cruncher on the farm financial stress task force for the dean of the College of Agriculture. It was an extraordinary experience during those tough times."

Jolly served as Barkema's major professor. The emeritus professor of economics says Barkema's broad knowledge of economics and agriculture sets him apart from most agricultural economists.

"There aren't many folks who can bring together macroeconomics and production ag like Alan. His career-long interest in how macroeconomics, things like money supply, employment, inflation, interest rates and so forth, have influenced the ag sector are a hallmark of his," says Jolly. "On top of that, he has well-honed skills that make economics—the dismal science as some have termed it—coherent and understandable. He explains some pretty challenging things in a very non-threatening way."

Alan Barkema (right) retired senior vice president for the Federal Reserve Bank of Kansas City, visits with agricultural business students Wyatt Saeugling (left) and Reilly Ryan in an East Hall classroom while guest lecturing in associate professor Chad Hart's agricultural marketing class this spring.

"Kansas City has always maintained the Federal Reserve's agricultural brain trust, and that is still true today."

Barkema credits former career services director Roger Bruene for first helping him find his way at Iowa State and introducing him to another main mentor—agronomy professor Ken Frey.

"I worked for Dr. Frey the summer before my senior year as an apprentice to see how science worked and get acquainted with field work and plant breeding," Barkema says. "Dr. Frey was a world famous scientist."

Barkema earned a master's degree in plant genetics from Cornell University in 1978 and graduated from the executive program at Stanford University in 2009.

"The Stanford program broadly considered what affects an organization's performance, a big help to me in my role at the Kansas City Fed. Culture and teamwork are fundamental, and I encourage students to build their team skills during their ISU years."

He landed at the Kansas City Federal Reserve Bank in 1986.

"They were looking for someone who knew something about agriculture and monetary policy. I thought I'd go for a few years and get experience. That turned into 25 years, and I've been thrilled with the experience," Barkema says. "Initially agriculture was my beat. Kansas City has always maintained the Federal Reserve's agricultural brain trust, and that is still true today."

Barkema joined the faculty at Oklahoma State University and served as chair of the Department of Agricultural Economics for three years.

"That was a good time for me to take a break from the Federal Reserve and gain some new leadership experience in an

extraordinary educational and research setting," Barkema says.

He returned to the Federal Reserve, where he worked with fellow Iowa Stater Tom Hoening who was president of the Federal Reserve Bank of Kansas City from 1991 to 2011. Barkema retired in 2012 as the senior vice president and director of research.

"I served through the financial bust of the late 2000s. It was a difficult period for the nation, and an extraordinary challenge. I learned so much and worked with such wonderful and amazingly talented people. It allowed me to see the economy and agriculture from a whole new level and light."

Barkema shared his experiences and expertise at Iowa State University in April as he presented the 2017 Carl and Marjory Hertz Lecture in Emerging Issues in Agriculture.

He offered his thoughts on current trends and issues impacting agricultural economics nationally and globally. Barkema says that while some connect today's economic climate to the farm boom and bust of the 1970s and 1980s, there are important differences between then and now.

"A calamitous drop like that of the 1980s is unlikely, because the economic

environment is much different today. Inflation is at a modest level, and the economy is on a slow growth path. This calls for measured and deliberate action, not what we had in the '80s," Barkema said during the lecture. "Looking ahead, agriculture will face tough challenges, but global food demand will grow."

Barkema encouraged students to ask tough questions, and bring issues into focus in a way that leads to logical conclusions.

Following Barkema's presentation, Kayleigh Koch, a sophomore in agricultural business raised her hand.

"When you were a student you said a question you pursued was, 'how do we feed a growing population?' What do you believe is another major issue in agriculture students like myself should be working to solve," Koch asked.

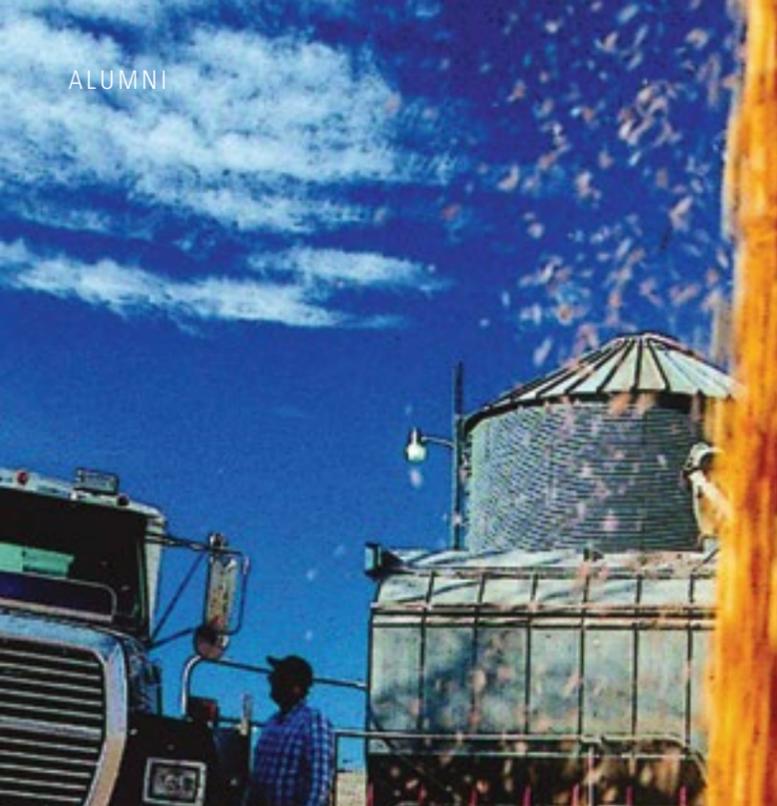
"I grew up in the era when trying to feed a growing global population was front and center. And, there is still much to be done there. But, the questions that swirl in my mind are how to feed the world in a sustainable way and in a way that makes good business sense. I think those are the two major questions," Barkema replied.

"But, I'm sure you'll have better questions as you move forward." 📺



STORIES EXTRA: www.stories.cals.iastate.edu

Barkema presented the seventh annual Carl and Marjory Hertz Lecture on Emerging Issues in Agriculture at Iowa State in April. Watch Barkema's complete presentation, "Pursuing Questions: Prospects for the Economy and Agriculture" online.



"Combine Camaraderie" circa 2005

The Grimmius family near Grundy Center, Iowa, stopped for a quick chat during harvest just down the road from Persinger's home farm. The secret to photographing silhouettes, Persinger says, is "to make sure you can see arms and legs on each individual."



"A Love of Lefse" circa 1970

This was one of Persinger's first "real people" photographs. Taken during his stint in Norway with the International Farm Youth Exchange, it features the neighbor of his host farm family rolling out dough for Lefse (Norwegian flat bread).



"Giant Thumbprint" circa 1986

This landscape photo featured a recently tilled fallowed wheat field after a fresh snow in eastern Washington.

Photo essay by Harlen Persinger
Story by Melea Reicks Licht

NO FILTER

A CAREER IN PICTURES



"Golden Time" circa 2007

Persinger grabbed this picture by taking a unique angle of a common harvest scene on a neighbors' farm near Grundy Center, Iowa.

Harlen Persinger received the Lifetime Achievement Award from the American Agricultural Editors Association (AAEA) at the organization's annual meeting last July. Persinger is the first photojournalist, freelancer and active farmer to receive the award.

"Harlen's dedication to the industry and his willingness to help budding photojournalists learn their craft is unequalled among his peers," says Den Gardner, former executive director of the AAEA. "His passion for agriculture drives him to give 110 percent in everything he does."

Persinger ('67 dairy science, '72 ag journalism), a native of Grundy Center, took his first picture on the Iowa State University campus. The subject was the campanile.

He captured his first photographs abroad while visiting 10 countries as part of the Iowa State University Ag Travel Course in 1966. He became more interested in photography while serving in Vietnam with the U.S. Army in the late 1960s and refined his skills working on farms in Norway as part of the International Farm Youth Exchange following his deployment.

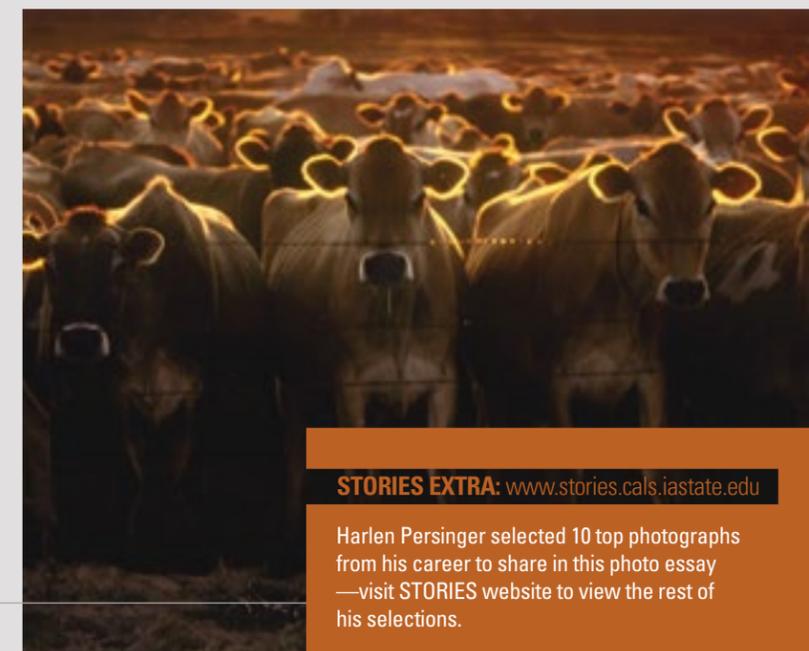
He returned to Iowa State to pursue ag journalism and built a 45-year career telling stories with pictures. Persinger worked for Harvestore Farmer Magazine, Webb Publishing, Bader Rutter and since 2004, freelancing for regional and national farm publications. His work can be found in popular agricultural media outlets, the Peace Corps annual calendar and in the winner's circle at the Iowa State Fair.

"A good photograph starts with having an excellent eye for composition, and the only way to develop that is through years of practice," Persinger says. "The best shots involve an interesting angle, the right balance of light, leading lines that draw you in and a touch of red. Red is like a spotlight in a photograph." 📷



"Aflac Audition" circa 2013

Fascinated by the ducks, Persinger literally chased down this driver on a back road in Vietnam to get this shot. The driver stopped just long enough for him to take five quick frames. He never determined how the ducks were secured on the motorcycle.



STORIES EXTRA: www.stories.cals.iastate.edu

Harlen Persinger selected 10 top photographs from his career to share in this photo essay —visit STORIES website to view the rest of his selections.

CALS Ambassador **Joni Erwin** (in red) shows FFA members from Clarion Goldfield Dows and Iowa River around Jack Trice Stadium during the Iowa FFA Convention in April. Erwin ('17 agricultural business) served as a CALS ambassador while a student.



BELIEVE

PARTNERING FOR THE FUTURE OF AGRICULTURE

Story by Melea Reicks Licht
Image by Christopher Gannon

The number of Iowa youth who believe in the future of agriculture is at an all time high.

Membership in the Iowa FFA is now approaching 15,000 youth in 232 chapters. True to their creed beginning with the phrase, "I believe in the future of agriculture, with a faith born not of words but of deeds..." the agricultural youth leadership organization is proving more relevant than ever before.

Why?

"People pay more attention to their food," says Josh Remington, executive director of the Iowa FFA Foundation. "In addition to paying more attention to what they eat, youth want to tackle the challenge of 'feeding the nine' and be a part of the solution to global hunger. We are tasked to do so with less land and inputs. Youth and their parents see career opportunities in addressing these challenges."

The Iowa FFA and the College of Agriculture and Life Sciences team up to offer a career pipeline to address global and local challenges in agriculture and life sciences.

"FFA offers a leg up in gaining skills and knowledge necessary for these

careers. Once students are ready to select a college Iowa State feels like home thanks to their FFA experiences on campus," Remington says.

Andy Zehr, director of marketing and new student programs in the college, agrees.

"Students in FFA come to us with a greater awareness of the breadth of career opportunities in agriculture. They can articulate their goals in a way that allows us to help them find their home on campus," Zehr says. "That's one reason why our students are less likely to switch to majors outside of the college—they have spent more time considering these types of careers than the typical student."

Scott Johnson, executive secretary of the Iowa FFA Association, says the state's membership has increased 69 percent over the last 25 years with 14 percent growth happening in the last four years. He credits the organization's mighty volunteer force for providing members with leadership development opportunities.

"FFA works with students at an age when they grow, learn, develop and mature. From freshmen to seniors, we help them find their way and stay connected with agriculture," Johnson says.

The college's partnership with Iowa FFA includes:

- Enhancing science, technology, engineering and math (STEM) through secondary agricultural education—Mike Retallick, chair of agricultural education and studies, leads this effort with FFA advisers
- Recruiting FFA advisers and agriculture teachers including the National Teach Ag Campaign
- Hosting Career Development Events (CDEs) on Iowa State campus providing facilities and expertise
- Hosting Iowa FFA Convention on Iowa State campus offering members access to people, programs and places showcasing college life and opportunities
- CALS offers scholarships to FFA members participating in select CDEs and eight state convention raffle prize winners
- 67 percent of Iowa FFA advisers and secondary agriculture teachers are CALS graduates

STORIES EXTRA: www.stories.cals.iastate.edu

Former FFA members – the Iowa FFA needs your help! Visit the Iowa FFA online to sign up to receive updates from the organization on how you can support the future of agriculture.

PUSHING PROFITS

HIGHER

Story by Grant Wall
Image by Bob Elbert



Iowa farmers produced a record 2.7 billion bushels of corn and 571 million bushels of soybeans in 2016, generating over \$14.5 billion in production value.

"Iowa farmers are great at what they do," says Steve Johnson, farm management specialist with Iowa State University Extension and Outreach. "Where we come into play is helping farmers manage price risk resulting from these large crops."

Johnson is one of eight farm management specialists serving farmers around the state, offering farmers the latest information on farm financial and risk management strategies and marketing tools.

He leads ag marketing clubs that meet during the late fall and winter months in Lynnville, Conrad and Ogden. Farmers gather monthly to discuss trends and best practices for managing a variety of crop risks.

"These groups help farmers build knowledge regarding a variety of crop production and marketing topics that lead to the development and implementation annually of crop marketing plans," Johnson says.

The most important thing farmers need to know, according to Johnson, is their cost of production as well as the cost of grain ownership once those bushels are stored. Without this information, farmers will likely struggle to identify a good price at which to sell their crops.

"You might not know your actual costs until after harvest, but an estimate will give farmers an objective for what would be a reasonable break-even price and profit margin," Johnson says. "There is a lot of uncertainty that comes with row crop agriculture, but a large portion of uncertainty is taken away with the use of revenue protection crop insurance."

This type of information is invaluable for farmers like Jeff and Cheryl Bruene, who farm near Gladbrook. The Bruenes have been a part of Johnson's ag marketing club in Conrad for over a decade.

"I feel like I could go to Steve with any problem on the farm," Jeff Bruene says. "He might not have the answer or information right at hand, but he will help point me in the right direction or help find the answer. I learn something at every

Steve Johnson (right), extension farm management specialist, chats with **Jeff and Cheryl Bruene**, who farm near Gladbrook. Johnson emphasizes understanding cost of production and cost of grain ownership in storage when determining the best time to sell.

meeting. I've always been a believer that ISU Extension and Outreach is your friend. Farmers need to be using more people like Steve."

Johnson has seen the risk management skills of the Bruene's operation improve since beginning to work with them.

"They have been able to incorporate the use of crop revenue insurance to be more aggressive in pre-harvest marketing and in timing futures price rallies to make sales," Johnson says.

One tactic the Bruenes use each spring, and Johnson stresses, is selling a portion of their new crop bushels. With the uncertainty of production comes higher futures prices in April, May and June. The Bruenes then sell a portion of their guaranteed insurance bushels using revenue protection crop insurance. These pre-harvest sales provide needed cash flow during the fall and winter months at what are typically higher cash levels than waiting until harvest.



Members of campaign **Forever True** leadership in the College of Agriculture and Life Sciences gathered for a team huddle with Cy during a recent visit to campus. These alumni and friends have signed on to help the college and university raise \$1.1 billion. Back row (from left): **Jim Frevert, Roger Underwood, Pete Wenstrand, Cy, Wendy Wintersteen, Dana Robes and Rich Degner.** Front row (from left): **Clare Frevert, Dana Wenstrand, Owen Newlin, Chris Cornelius and Chuck Cornelius.**

STANDING FOREVER TRUE

Story by Betsy Snow Hickok
Image by Barb McBreen

Last September, Iowa State University kicked off the public phase of *Forever True, For Iowa State*, a campaign to raise \$1.1 billion for the university. Alumni and friends have signed on to help lead campaign efforts for the university and the College of Agriculture and Life Sciences.

With a name inspired by the Iowa State Fight Song, the university-wide *Forever True* campaign will ensure access to an Iowa State education, advance expertise in key areas addressing global challenges and enhance the university's impact on the economy and quality of life in Iowa and around the world.

These university campaign goals perfectly align with Dean Wendy Wintersteen's vision for the College of Agriculture and Life Sciences.

"With a world population expected to reach more than 9.6 billion by 2050, the demand for our college's distinctive strengths in science, education and extension and outreach will be greater than ever in the coming decades," says Wintersteen.

The campaign will be transformative for the college. The college's goal of \$200 million will support six key areas:

- global agriculture
- biosciences
- student and faculty enrichment
- agricultural business and entrepreneurship
- sustainability
- new innovative facilities for animal agriculture teaching and research

In strengthening these areas, the campaign will ensure the college continues to provide a world-class education that meets the needs of tomorrow's students.

"Thankfully, our alumni and friends have always been our greatest allies in meeting new goals," says Wintersteen. "With their help and support, the *Forever True* campaign will provide a timely

opportunity to create a college ready to embrace the future."

A few of the alumni and donors leading the charge to help the college reach its campaign goal offered their thoughts on the importance of *Forever True*—and why they choose to be involved.

- "Kathryn and I personally support student scholarships because there's a lot of need as student enrollment grows. We created funds in areas that are important to us, including scholarships that honor our parents. I was very appreciative of the support I received as a student, and it felt appropriate to give others the same opportunities. The themes and goals of the *Forever True* campaign come down to supporting the basic tenets of the land-grant mission. The college's priorities are very much in

line with that vision. The campaign is focused on generating funds to maintain and grow our tradition of educational excellence, to support our world-renowned faculty as they conduct top-notch research while teaching and mentoring students and to build facilities that encourage the hands-on learning that makes our students so highly sought by employers. These are world-class objectives." – Lloyd Bettis, ('70, agricultural journalism), College of Agriculture and Life Sciences campaign committee member and ISU Foundation campaign cabinet member

- "A lot of graduates have a faculty mentor or class they feel made all the difference in getting their careers and lives started. One of the college's most unique resources, the Ag 450 Farm, is the only completely student-managed farm at a land-grant university in the nation. Ag 450 was the class I valued most because it does such a great job of teaching practical knowledge and teamwork. When it came time to give back, we decided to endow a faculty position for Ag 450. It takes a special faculty member to lead this class—someone with a full range of farm management knowledge, from production to marketing. We wanted to be sure there's always a top faculty member in that position." – Jim Frevert ('60 farm operation), College of Agriculture and Life Sciences campaign committee member

Members of the College of Agriculture and Life Sciences campaign committee:

- **Wendy Wintersteen** ('88 PhD entomology), endowed dean, campaign committee chair
- **Lloyd Bettis** ('70 BS agricultural journalism)*
- **Chris** ('83 agricultural journalism) and **Chuck Cornelius** ('83 agronomy)
- **Nancy** ('72 food science) and **Rich Degner** ('72 agricultural and life sciences education, '77 MS agricultural and life sciences education)
- **Clare and Jim Frevert** ('60 farm operation)
- **Howard** ('73 MS, '74 PhD veterinary microbiology and preventative medicine) and **Nancy Hill** ('74 MS education)
- **Owen Newlin** ('51 BS agronomy, '53 MS crop production)*
- **Dana Robes** ('67 BS dairy science)*
- **Roger Underwood** ('80 agricultural business)*
- **Dana** ('87 BS home economics education) and **Pete Wenstrand** ('74 BS agricultural business)

* Also serving on the university-wide *Forever True* campaign cabinet

AG AND BIOSYSTEMS ENGINEERING GRADUATE PROGRAM TOPS IN THE NATION

Iowa State's graduate program in agricultural and biosystems engineering jumped one spot to No. 1 in the nation according to this year's rankings released by *U.S. News and World Report*. The program, which is co-administered by the colleges of Agriculture and Life Sciences and Engineering, also jumped to the top of the undergraduate rankings last fall.

CALS GRADS NAMED STATEMENT MAKERS BY THE ISU ALUMNI ASSOCIATION

Four young college alumni were honored by the ISU Alumni Association as "STATEment Makers" for their personal, service, entrepreneurial, business and scholastic achievements.

Cameron Creighton ('06 industrial technology), product manager, Toyota North America, Torrance, California

Jenny Lichty ('09 ag and life sciences education, '14 MS), agricultural educator and FFA adviser, Ballard Community Schools, Huxley, Iowa

Deepak Premkumar ('14 global resource systems, economics, mathematics), graduate student, University of California-Berkeley, Berkeley, California

Joe Sweeney ('13 ag business), CEO, Eagle's Catch, Ankeny, Iowa



CARLSON HONORED AS EMERGING IOWA LEADER

Stephanie Carlson ('13 animal science), producer outreach and federal policy director with the Iowa Pork Producers Association received the 2017 Emerging Iowa Leader award during the college-sponsored basketball game on January 21. Carlson serves in the college's young alumni initiative, Curtiss League, and is an active advocate for Iowa's agricultural industry. (Read more on page 31.)

BARKEMA SPEAKS AT HERTZ LECTURE

Alan Barkema, retired senior vice president for the Federal Reserve Bank of Kansas City, presented the 2017 Carl and Marjory Hertz Lecture on Emerging Issues in Agriculture April 11 at Iowa State. Barkema's ('73 farm operation, '85 MS economics, '86 PhD economics) presentation "Pursuing Questions: Prospects for the Economy in Agriculture," is available online at www.stories.cals.iastate.edu. (Read more on page 32.)



ROSS SELECTED AS CARET REPRESENTATIVE

Kevin Ross, a farmer near Underwood, has been appointed to represent the College of Agriculture and Life Sciences and Iowa State University Extension and Outreach on the Council for Agricultural Research, Extension and Teaching (CARET). Ross ('03 ag studies) is a licensed crop insurance agent for the Home Agency, board officer for Western Iowa Energy, LLC, and serves on the National Corn Growers Association Board.

CALS ALUMNI, FRIENDS RECEIVE TOP HONORS FROM IOWA STATE

CALS alumni and friends were among those honored by the ISU Alumni Association and ISU Foundation during the annual Distinguished Award Celebration April 7.

Larry Ebberts ('62 ag and life sciences education, '68 MS, '71 PhD higher education), received the Distinguished Alumni Award from the ISU Alumni Association.

Roy Reiman ('57 ag journalism), chairman of Hexagon Investments and **Bobbi Reiman** ('06 honorary), received the Order of the Knoll True and Valiant Award from the ISU Foundation.

ISU RESIDENCE HALL HOUSES NAMED FOR CALS ALUMS

Iowa State's newest residence hall, Geoffroy Hall, opened for students at the beginning of January. The hall includes two houses named for college alumni.

Lauro Cavazos ('54 PhD genetics), professor of public health and community medicine at Tufts University School of Medicine. He formerly served as U.S. Secretary of Education and president of Texas Tech University.

Larry Ebberts ('62 ag and life sciences education, '68 MS, '71 PhD education), emeritus University Professor in the Iowa State University School of Education and former coordinator of residence life.

ASFMRA NATIONAL HONORS TO CALS DEAN, ALUMNUS

The American Society of Farm Managers and Rural Appraisers (ASFMRA) has honored agricultural and life sciences endowed dean, **Wendy Wintersteen** ('88 PhD entomology) with the Charles F. Curtiss Distinguished Service to Agriculture Award. **Richard Pringnitz** ('85 farm operation), accredited farm manager and rural appraiser with Hertz Farm Management, was honored by ASFMRA and Syngenta as 2016 Professional Farm Manager of the Year.



CARRIQUIRY NAMED TO ACADEMY OF MEDICINE

Alicia Carriquiry, a Distinguished Professor of statistics, was elected to the National Academy of Medicine. During her 26-year career, Carriquiry ('86 MS statistics, '89 PhD statistics, animal science) has developed statistical methods to better measure food consumption. Her work also has focused on evaluation of Veterans Affairs mental health services.



MELLION-PATON NAMED VICE CHANCELLOR

Dawn Mellion-Patin ('95 PhD ag and life sciences education) has been appointed vice chancellor for extension and outreach by the Southern University Agricultural Research and Extension Center. She has served the institution since 2003 as an ag specialist and associate specialist in agriculture for the cooperative extension program.



KOLISON APPOINTED EXECUTIVE VICE PRESIDENT AND PROVOST

Stephen Kolison ('86 MS forestry, '90 PhD) has been appointed executive vice president and provost for the University of Indianapolis. In his role, Kolison will lead more than 550 faculty for the university, which boasts an enrollment of more than 6,500 undergraduate and graduate students and is ranked among the top Midwest Universities by U.S. News and World Report.

IN OUR NEXT ISSUE

STORIES

IN AGRICULTURE AND LIFE SCIENCES

SMALL BUT MIGHTY SCIENCE

Learn about **MICRO-SCALE** science making **BIG IMPACTS** in the next STORIES in Agriculture and Life Sciences. You'll learn about efforts to address **ANTIMICROBIAL RESISTANCE** in the animal production food chain and how **MICROBES** help or hinder **PLANT HEALTH**. We'll introduce you to **TINY CREEPY-CRAWLY AMBASSADORS FOR SCIENCE**. Glimpse the future through the lens of small plots and projects that may lead to major advances in **HUMAN HEALTH** and **ENVIRONMENTAL QUALITY**.

UPCOMING CALS ALUMNI EVENTS!

Connect. Engage. Share.



JULY 27

Cyclone Night at the Gardens, hosted by CALS, the ISU Alumni Association and the Greater Des Moines Botanical Gardens, Des Moines, Iowa

SEPT. 2

CALS BBQ, three hours prior to Cyclone football kick-off, Hansen Agriculture Student Learning Center

OCT. 7

Honoring Hoiberg: Celebrating a Distinguished Career, hosted by public service and administration in agriculture alumni, open to all students interested in honoring and reconnecting with former associate dean Eric Hoiberg, prior to ISU Bacon Expo, Hansen Agriculture Student Learning Center

IOWA STATE UNIVERSITY
College of Agriculture and Life Sciences

Look for details on these events, and other department and major-specific news in the college's **STORIES Online** e-newsletter. If you aren't receiving this monthly e-newsletter, subscribe by e-mailing stories@iastate.edu.

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